EXHIBIT 4

REDACTED VERSION

UNITED STATES DISTRICT COURT
NORTHERN DISTRICT OF CALIFORNIA

ANIBAL RODRIGUEZ, SAL CATALDO, JULIAN SANTIAGO, and SUSAN LYNN HARVEY, individually and on behalf of all other similarly situated, Plaintiffs v. GOOGLE LLC, Defendant.	No. 3:20-cv-04688-RS

REBUTTAL EXPERT REPORT OF CHRISTOPHER R. KNITTEL, PH.D.

May 31, 2023

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I. INTRODUCTION

A. Qualifications

1. My name is Christopher Knittel. I am the George P. Shultz Professor of Energy Economics and Professor of Applied Economics in the Sloan School of Management at the Massachusetts Institute of Technology ("MIT"). I received a Ph.D. in economics from the University of California, Berkeley in 1999 where my fields of specialization were industrial organization and econometrics. In 1996, I received a Master of Arts in economics from the University of California, Davis. In 1994, I received a Bachelor of Arts, summa cum laude, in Economics and Political Science, from the California State University, Stanislaus.

2. I am the Director of MIT's Center for Energy and Environmental Policy Research ("CEEPR"). CEEPR was formed in the 1970s and is the hub for social science work on energy and the environment at MIT. I am also the Deputy Director for Policy of the MIT Energy Initiative, which serves as MIT's hub for energy research, education, and outreach.

3. I am a Research Associate at the National Bureau of Economic Research in the Industrial Organization, Productivity, and Environment and Energy Economics programs. I co-direct the Environmental and Energy Economics program within the NBER. I am also an Associate Editor of the *Journal of Transportation Economics and Policy*. I was previously the co-editor of the *Journal of Public Economics* and Associate Editor of the *Journal of Energy Markets*, the *American Economic Journal: Economic Policy*, and the *Journal of Industrial Economics*. I have also sat on the outside review committee for the National Science Foundation's Social and Economic Science grant program.

4. My research focuses on how consumers, firms, and policy makers interact in the marketplace; this is known as industrial organization. I have authored numerous articles on topics related to consumer and firm behavior in various markets. These articles have appeared in many leading academic journals, including *American Economic Review, Journal of Political Economy, Review of Economics and Statistics, American Economic Journal: Economic Policy, Energy Economics, Journal of Industrial Economics, the RAND Journal of Economics, the Journal of Banking and Finance, and Management Science*.

5. A copy of my complete *curriculum vitae* is attached as **Appendix A,** which includes all trial or deposition testimony I have given in the last four years.

B. Assignment

6. I have been retained by Willkie Farr & Gallagher LLP ("counsel") on behalf of Google, LLC ("Google" or "Defendant") in connection with the matter of *Anibal Rodriguez, et al., v. Google LLC*, pending in the United States District Court for the Northern District of California.[1] I have been asked to review the expert report of Michael J. Lasinski, who has submitted an expert report on behalf of Anibal Rodriguez, Sal Cataldo, Julian Santiago, and Susan Lynn Harvey (collectively, "Plaintiffs"), and to provide my expert opinion as to Mr. Lasinski's methodologies to calculate class-wide damages in this matter and his damages estimates themselves.[2]

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[1] *Anibal Rodriguez, Sal Cataldo, Julian Santiago, and Susan Lynn Harvey, individually and on behalf of all other similarly situated, v. Google, LLC*, Fourth Amended Complaint, 3:20-cv-04688-RS, January 4, 2023 ("Complaint").

[2] *See* Expert Report of Michael J. Lasinski, February 20, 2023 ("Lasinski Report"). My decision not to respond specifically to any of Plaintiffs' experts' opinions in this report should not be construed as an endorsement of that opinion.

C. Report Preparation

7. My billing rate for time spent on this matter is $950 per hour. In addition, I receive compensation based on the professional fees of Analysis Group, Inc., an economic and litigation consulting firm whose employees have provided research support under my direction and supervision. Neither my compensation nor that of Analysis Group is in any way contingent on the nature of my opinions or the outcome of this litigation.

8. In forming my opinions, I have reviewed materials, data, and information provided to me by counsel or obtained from public sources. These materials include, among others, the Fourth Amended Complaint, the Lasinski Report, the documents Mr. Lasinski lists or cites in his report, certain documents the parties produced in the case, deposition testimony of various Google employees and named Plaintiffs, and various data and publications from publicly available sources. The facts and data that I have considered in forming my opinions are identified in this report, the accompanying exhibits, and/or **Appendix B**.

9. I understand that discovery in this matter is ongoing. I reserve the right to adjust or supplement my opinions as appropriate and permitted by the Court should additional relevant documents or data become available.

II. SUMMARY OF OPINIONS

10. Based on my professional experience, scholarly research, and review and analysis of the data and documents in this matter to date, I have reached the following opinions. A full description of my opinions is contained throughout this report, including the accompanying exhibits.

a. Mr. Lasinski's estimates of disgorgement of profit and "actual" damages include many putative class members who could not have been affected by the alleged wrongful conduct (*i.e.*, Google's alleged tracking of certain users' app-activity data without the users' consent) because he fails to exclude users that did not allow Google to know their sWAA on/off status. Notably, this includes all users of iOS 14 or later.

b. The testimony of named Plaintiffs is inconsistent with Mr. Lasinski's methodology to calculate class-wide damages.

c. Mr. Lasinski's disgorgement of profit damages analysis assumes unrealistic and unnecessarily restrictive but-for worlds that lead him to overstate damages. Mr. Lasinski fails to consider alternative, plausible, and more realistic but-for worlds.

    i. Mr. Lasinski ignores the change in demand and revenue that Google would have experienced in a but-for world with alternative disclosures on how turning sWAA off does not opt the user out of conversion measurement in third-party apps.

    ii. Mr. Lasinski ignores that third parties could continue to provide conversion measurement services in the but-for world.

d. Mr. Lasinski's methodology for calculating disgorgement of profit damages rests on unreliable assumptions, and as a result Mr. Lasinski overstates damages.

    i. Mr. Lasinski incorrectly assumes that all putative class members suffered harm in equal manner. He fails to account for lower account activity—and, consequently, lower revenue—associated with accounts that turned sWAA off.

ii. Mr. Lasinski incorrectly assumes that Google earns revenue from conversion measurement (*i.e.*, measuring users' interactions with advertisements in third-party apps), and provides an unsupported estimate of revenue attributable to Google's use of sWAA-off data for conversion measurement.

iii. Mr. Lasinski incorrectly calculates Google's revenue purportedly attributable to signed-in, sWAA-off users.

iv. Mr. Lasinski fails to deduct all relevant costs associated with the advertising product areas that he considers for disgorgement of profit damages.

v. Correcting certain flaws in Mr. Lasinski's methodology would substantially reduce his disgorgement of profit damages estimates, from $558.8 million to $74.0 million for his Scenario 1 (a reduction of 86.8 percent) and from $664.3 million to $89.8 million for his Scenario 2 (a reduction of 86.5 percent).[3]

e. Mr. Lasinski's methodology for calculating "actual" damages is unreliable and would overstate any class-wide damages.

i. Mr. Lasinski's methodology fails to measure actual harm that would arise from the alleged wrongful conduct.

ii. Mr. Lasinski fails to consider the value of private data as implied by other data transactions in which putative class members may have engaged.

[3] Reduced disgorgement of profit damages estimates of $74.0 million for Scenario 1 and $89.8 million for Scenario 2 are based on applying adjustments for sWAA off traffic based on clicks. Damages estimates would be $111.9 million for Scenario 1 and $135.7 million for Scenario 2 by applying adjustments for impressions instead.

iii. Mr. Lasinski fails to exclude users associated with no traffic or revenue.

iv. Mr. Lasinski presents no economic basis for his "actual" damages estimate of $3 per device per putative class member.

v. Mr. Lasinski's examples of users' willingness to pay to prevent data collection and research organizations' payments for data collection do not measure the value of the data at issue in this matter and are disconnected from any case-specific facts.

vi. Mr. Lasinski fails to provide sufficient foundation or economic analysis for his estimate of the size of the putative class.

f. Mr. Lasinski's methodology for apportioning damages is unreliable.

i. Mr. Lasinski's apportionment methodology is inconsistent with his own methodology to calculate damages. Mr. Lasinski proposes apportioning damages commensurate with the number of months during which an account was in sWAA-off status, whereas his damages methodology completely ignores this duration measure.

ii. Mr. Lasinski's methodology to apportion disgorgement of profit damages and "actual" damages ignores heterogeneity among putative class members with respect to the volume and quality of data at issue purportedly received by Google.

iii. Mr. Lasinski provides no methodology to attribute his measured "sWAA Off User Months" to each putative class member.

III. SUMMARY OF ALLEGATIONS

11. Plaintiffs allege that Google "collects and saves users' app-activity data" and does so "without notice or consent, where Plaintiffs had turned off a Google feature called 'Web & App Activity' ('WAA') or a sub-setting within WAA known as 'supplemental Web & App Activity' ('sWAA')."[4] Plaintiffs claim that "Google repeatedly and falsely represented that its users […] could prevent Google from intercepting their communications by turning off WAA and/or sWAA."[5] Plaintiffs claim that users relying on these representations "had the objectively reasonable belief that Google would stop collecting their communications and other interactions with apps on their phones – 'across [Google's] services' – if the users turned the WAA and/or sWAA switch to 'off.'"[6]

12. According to Plaintiffs, "[i]n or before 2015, Google launched the 'Web & App Activity' feature" for Google accounts, which users can access "through Google's website, and through the 'Settings' menu of a mobile device running Android OS."[7] The WAA feature can be toggled on and off and is displayed above the following text: "Saves [to a user's Google account] your activity on Google sites and apps, including associated info like location, to give you faster searches, better recommendations, and more personalized experiences in Maps, Search, and other Google services."[8] Below the WAA toggle, there is a separate checkbox, referred to as the sWAA feature, providing the option to "[i]nclude Chrome history and activity from sites, apps,

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4 Complaint, ¶¶ 1, 4.
5 Complaint, ¶ 210.
6 Complaint, ¶ 96.
7 Complaint, ¶¶ 74–75.
8 Complaint, "Screen 2" image at p. 22. Google's disclosures to users specified that searches and activity from Google services would be "saved in your Google Account, so you may get more personalized experiences." *See* "See & control your Web & App Activity," Google Search Help, March 7, 2020, available at https://web.archive.org/web/20200307144113/https://support.google.com/websearch/answer/54068?hl=en&co=GENIE.Platform%3DAndroid (accessed using the Wayback Machine).

and devices that use Google services."[9] For sWAA to be turned on, WAA must also be on, but a user can turn WAA on and have sWAA either on or off.[10] That is, users must share their Google site and app activity (*i.e.*, turn WAA on) to share their Chrome activity, but users may opt not to share their Chrome activity if they share their Google site and app activity (*i.e.*, turn WAA on and sWAA off). At issue in this case are "app activity data" that Google allegedly collected "while WAA is turned off, including personal browsing data," despite Google's alleged promise "that by turning off this feature, users would stop Google from saving their web and app activity data, including their app-browsing histories" to their Google account for providing personalized experiences.[11]

13. Specifically, Plaintiffs claim that Google collects and saves such data through the following Google products:[12]

a. **Firebase Software Development Kit ("SDK"):** Firebase is "an app development platform" "[b]acked by Google" that offers software development kits ("SDKs") for third-party developers to develop apps across many platforms, including the Android and iOS operating systems and web.[13] The Firebase SDK can be integrated and used with other Google products such as the Google Play store, Google's web analytics platform Google Analytics, Google's advertising platform for mobile apps AdMob, and Google Cloud.[14] Plaintiffs allege that "Google intercepts and copies [communications between users and third-party apps] using

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9 Complaint, ¶ 78.
10 Complaint, ¶ 78.
11 Complaint, ¶¶ 1, 8.
12 In addition to the Google products summarized here, Plaintiffs also mention the "Google Analytics Services SDK" and the "Google Ads SDK (formerly known as AdWords SDK or AWCT SDK)" (Complaint, ¶ 4) and "WebView" (Complaint, ¶ 68). The Lasinski Report does not reference these three products.
13 "Firebase," Firebase, available at https://firebase.google.com/. *See also* Complaint, ¶¶ 39, 47.
14 "Firebase," Firebase, available at https://firebase.google.com/. *See also* Complaint, ¶ 41.

the Firebase SDK scripts, even when the user has exercised their privacy controls by turning WAA and/or sWAA off."[15] These communications include the user "viewing content, creating new content, or sharing content," and the data allegedly collected include information "such as the mobile app page being requested and the device from which the request is being made."[16]

b. **AdMob+ SDK:** Plaintiffs also allege that "one additional tracking and advertising code that Google uses to collect and save information about users' app-activity data – regardless of whether WAA or sWAA is switched off – is Google's AdMob+ SDK."[17] Plaintiffs describe the AdMob+ SDK as "an upgraded version of Google's AdMob product that allows Google to collect and save the same user app -activity [*sic*] data even with respect to apps that do *not* use the Firebase SDK."[18]

c. **Google Mobile Ads SDK:** Plaintiffs claim that "[b]y way of the Google Mobile Ads SDK, Google collects and saves data entirely separate from the data that Google collects and saves by way of Google's Firebase SDK scripts."[19] Specifically, these data include "information about ad impressions – when an app displays an ad to a user" and "ad clicks, meaning information about when a user clicks on a particular ad."[20] Plaintiffs allege that "Google collects this app-activity

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15 Complaint, ¶ 48.
16 Complaint, ¶¶ 49–50.
17 Complaint, ¶ 60.
18 Complaint, ¶ 63.
19 Complaint, ¶ 64.
20 Complaint, ¶ 66.

information from the user and her device and uses it to serve advertisements to the user notwithstanding whether the user has switched off WAA and/or sWAA."[21]

14. Plaintiffs allege that Google "includes in its user profiles data secretly transmitted to Google from consumer devices by Google tracking and advertising code during times that the user had switched off WAA and/or sWAA," and that Google uses these data "to more effectively target advertisements to these users."[22]

15. Plaintiffs bring these allegations on their own behalf and on behalf of two proposed classes. Class 1 consists of "[a]ll individuals who during the [proposed] Class Period (a) turned off 'Web & App Activity,' or supplemental 'Web & App Activity,' and (b) whose mobile app activity was still transmitted to Google, from (c) a mobile device running the Android operating system (OS), because of the Firebase SDK and/or AdMob SDKs, on a non-Google branded mobile app."[23] Class 2 consists of all individuals who meet all other criteria for Class 1 but whose data was transmitted from "(c) a mobile device running a *non*-Android operating system (OS)."[24] Plaintiffs' proposed class period is defined as beginning "on the date Google first received data, as a result of Firebase SDK and/or AdMob SDKs scripts, from the device of a user who had turned off (or paused) WAA and/or sWAA" and continuing "through the present."[25]

16. Plaintiffs allege that "[d]espite Google's false representations to the contrary, Google effectively charged Plaintiffs, [putative] Class members, and other consumers and Google was unjustly enriched, by acquiring their sensitive and valuable personal information

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[21] Complaint, ¶ 67.
[22] Complaint, ¶ 143.
[23] Complaint, ¶ 249.
[24] Complaint, ¶ 249.
[25] Complaint, ¶ 249.

without permission and using it for Google's own financial benefit, including to advance its advertising business."[26] Plaintiffs claim that Google "effectively charged" them and other putative class members by using their data for free. In particular, Plaintiffs argue that "Google's ill-gotten gains include, but are not limited to, profit earned from: serving advertisements to WAA-off users, measuring advertisements' effect on WAA-off users' behavior, and developing and refining Google products using data saved from WAA-off users."[27] Based on these claims, Plaintiffs argue that "Plaintiffs and the [putative] Class members […] are entitled to reasonable compensation including but not limited to disgorgement of profit related to the [allegedly] unlawful internet tracking."[28]

17. Further, Plaintiffs allege that "Plaintiffs and [putative] Class members have been damaged by Google's invasion of their privacy and are entitled to just compensation and injunctive relief."[29] Specifically, Plaintiffs argue that "[putative] Class members […] assign value to keeping their data *private*," which "is destroyed when the Firebase SDK scripts and other Google tracking and advertising code surreptitiously transmit users' data to Google while the users have turned off WAA and/or sWAA."[30]

IV. BACKGROUND

18. In this section, I provide an overview of certain aspects of the AdTech economy that underlie my discussion of Mr. Lasinski's proposed methodology to calculate class-wide damages in this matter.

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[26] Complaint, ¶ 264.
[27] Complaint, ¶ 267.
[28] Complaint, ¶ 301.
[29] Complaint, ¶ 289.
[30] Complaint, ¶ 179.

A. Overview of the AdTech Economy

19. AdTech, short for "advertising technology," is the name given to a set of technologies that connect advertisers looking to promote their goods or services with apps or websites that have space to display these advertisements.[31] This ecosystem comprises several entities that include the buy-side, the sell-side, and intermediaries known as ad exchanges. The buy-side of the AdTech economy encompasses advertisers and agencies that want to purchase ad space within apps or websites to promote their products or services. They often work with Demand-Side Platforms ("DSPs"), which are used by advertisers to manage and purchase digital ad inventory from multiple ad exchanges through one interface. On the opposite end, the sell-side represents publishers or app developers who have ad inventory—spaces within their apps or websites where ads can be displayed—to sell. They often work with Supply-Side Platforms ("SSPs"), which enable publishers to manage, sell and optimize available ad inventory in an automated and efficient way.[32] An ad exchange is a digital marketplace where advertisers on the buy-side and publishers on the sell-side meet.[33] The ad exchange acts as the intermediary to facilitate transactions between members of those two groups.[34]

20. Transactions in these digital marketplaces are generally conducted via auctions, which can incorporate real-time bids from advertisers for each impression.[35] These transactions involve identifying the highest bid among advertisers for each available impression on each

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[31] *See, e.g.*, "What is adtech and why is it important?," Amazon Ads, available at https://advertising.amazon.com/library/guides/what-is-adtech.

[32] *See, e.g.*, "DSP, SSP, and Ad Exchange: What is the Difference?," AARKI, available at https://www.aarki.com/insights/dsp-ssp-and-ad-exchange-what-is-the-difference.

[33] "The DoubleClick Ad Exchange," Google, available at https://static.googleusercontent.com/media/www.google.com/en//adexchange/AdExchangeOverview.pdf.

[34] *See, e.g.,* "DSP, SSP, and Ad Exchange: What is the Difference?," AARKI, available at https://www.aarki.com/insights/dsp-ssp-and-ad-exchange-what-is-the-difference.

[35] *See* **Section IV.C.**

publisher's property for each user on that property. The use of technology and data to automate, optimize and measure ad buying and placement processes, known as programmatic advertising, has improved the scale and efficiency with which transactions take place.[36] AdTech has also led to advancements in user targeting, measuring audience behavior, and measuring ad effectiveness, which have increased ad placement alternatives for advertisers beyond the traditional offline world, while simultaneously allowing publishers to better monetize their online content through the sale of user-specific ad space to advertisers who value it the most.[37]

21. AdTech providers include social media platforms such as Meta, TikTok, LinkedIn, Snap, and Twitter; major retailers such as Amazon and Walmart; digital print platforms such as Washington Post; search platforms such as Google and Bing; online video platforms such as YouTube and Twitch; telecom providers such as AT&T and Verizon; and connected TV platforms such as Hulu and Roku, to name a few. A vast array of intermediaries support transactions, including ad exchanges, networks, sell-side platforms, demand-side platforms and many others. These services have improved efficiency in AdTech, yielding greater volumes of transactions that benefit advertisers and publishers, with increased ad targeting capabilities.[38]

B. Overview of Relevant Google Advertising Services

22. Google provides a number of products and services that are relevant to Mr. Lasinski's proposed methodology to quantify disgorgement of profit.

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[36] *See* "What is Programmatic Advertising and How Does It Work?," Publift, February 3, 2023, available at https://www.publift.com/adteach/what-is-programmatic-advertising.

[37] *See, e.g.,* "What is adtech and why is it important?," Amazon Ads, available at https://advertising.amazon.com/library/guides/what-is-adtech.

[38] *See, e.g.,* "What is adtech and why is it important?," Amazon Ads, available at https://advertising.amazon.com/library/guides/what-is-adtech.

a. The **Google Search Network** is an ad network that consists of "a group of search-related websites and apps" that provides advertisers with access to ad inventory on Google Search sites and apps, and on Google search partner sites and apps. Advertisers target their ads on the Google Search Network based on keywords. Likewise, the Google Search Network enables Google Search sites and apps, and Google search partner sites and apps to monetize search results.[39]

b. **Google Play** is "an online store where people go to find […] apps, games, movies, TV shows, books, and more."[40] Google Play is Google's pre-installed app store on Android-certified devices and ChromeOS.[41] Developers and other advertisers can use Google Ads to promote their apps on Google Play in "Google Play search results[,] Google Play related apps section: 'You might also like' and 'Related to this app' [, and] Google Play homepage: 'Suggested for you.'"[42]

c. The **Google Display Network** ("GDN") is an ad network, accessible to advertisers through Google Ads, including Google-owned properties Gmail, YouTube and Google Finance.[43] As opposed to text-based search ads, Google's

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39 "About the Google Search Network," Google Ads Help, available at https://support.google.com/google-ads/answer/1722047. Ads can appear on Google Search sites ("Ads can appear above or below search results on Google Search. They can appear beside, above, or below search results on Google Play, the Shopping tab, Google Images, Google Maps, and the Maps app.") or on Google search partner sites ("Ads might appear near or after search results of Google search partners or as part of a related search. Search partners include hundreds of non-Google websites as well as YouTube and other Google sites.").

40 "How Google Play works," Google Play, available at https://play.google.com/about/howplayworks/.

41 "Find the Google Play Store app," Google Play Help, available at https://support.google.com/googleplay/answer/190860?hl=en; "Install and use Android apps on your Chromebook," Google Play Help, available at https://support.google.com/googleplay/answer/7021273?hl=en.

42 "About App campaigns," Google Ads Help, available at https://support.google.com/google-ads/answer/6247380?hl=en.

43 "Reach a larger or new audience with Google Display Network targeting," Google Ads, available at https://ads.google.com/intl/en_id/home/resources/reach-larger-new-audiences/; "Google Display Network and YouTube on computers, mobile devices, and tablets," Google Ads Help, available at https://support.google.com/google-ads/answer/2740623?hl=en.

Display Network is designed for ads that are typically image based, such as banner and other image-based ads, native ads and social ads.[44] Advertisers typically use the Google Display Network to target ads according to customer interests and audience demographics.[45]

d. The **Google AdMob** network enables advertisers to access advertising inventory in mobile apps and enables mobile app developers to generate revenue by delivering in-app targeted advertising to their mobile app users on both Android and iOS platforms.[46] In addition to the advertisers aggregated by the AdMob ad network, AdMob also facilitates access to third-party (non-Google) ad networks.[47]

e. As Mr. Lasinski states in his report, app marketers can advertise in mobile apps using **Google App campaigns**, also known internally within Google as App Promo.[48] There are three distinct campaign types, each with its own set of conversions to monitor.[49] App Install Campaigns prioritize measuring app installs resulting from an app's ads. Since downloading an app doesn't guarantee usage, measuring first opens is a primary metric for app install campaigns, advertisers can measure this by measuring CPI, or cost-per-install. App Engagement

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44 "FAQ," Google Ads, available at https://ads.google.com/intl/en_id/home/faq/; "About Display ads and the Google Display Network," Google Ads Help, available at https://support.google.com/google-ads/answer/2404190?hl=en.

45 "Reach a larger or new audience with Google Display Network targeting," Google Ads, available at https://ads.google.com/intl/en_id/home/resources/reach-larger-new-audiences/.

46 "What is AdMob," Google AdMob, available at https://admob.google.com/home/resources/what-is-admob/; "Compare Ad Manager, AdSense, and AdMob," Google Ad Manager Help, available at https://support.google.com/admanager/answer/9234653?hl=en; "Get started with AdMob in your iOS project," Firebase, available at https://firebase.google.com/docs/admob/ios/quick-start.

47 "Compare Ad Manager, AdSense, and AdMob," Google Ad Manager Help, available at https://support.google.com/admanager/answer/9234653?hl=en.

48 Lasinski Report, ¶ 32.

49 "About App campaigns," Google Ads Help, available at https://support.google.com/google-ads/answer/6247380?hl=en. *See also* "Simple guide to conversion tracking for Google App Campaigns," App Radar, available at https://appradar.com/academy/google-app-campaign/conversion-tracking.

Campaigns concentrate on the in-app actions of a firm's existing users. Various in-app action goals exist, such as event promotion or reactivating app usage. The primary metric for engagement campaigns is CPA, or cost-per-action. App Campaigns for Pre-registration leverage Google's pre-registration feature, promoting app awareness before it becomes available on the Google Play store. The primary metric for such campaigns is CPPRE, or cost-per-pre-registration. This campaign type requires an app to be available for pre-registration and is applicable only for Android apps.[50]

C. Automated Bidding in Google's Digital Advertising Platforms

23. Automated bidding is a method of buying and selling digital advertising space in an ad exchange. The main providers of ad exchanges in the U.S. include Google, Meta, Amazon, Adobe, and PubMatic.[51] In 2021, Google accounted for 27.9 percent of U.S. digital advertising revenue, followed by Meta with 22.8 percent, and Amazon with 10.9 percent.[52]

24. Advertisers typically bid for ad space by contacting a programmatic advertising agency to assist them.[53] The agency then uses a DSP to automate the process of purchasing ad

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50 "About App campaigns," Google Ads Help, available at https://support.google.com/google-ads/answer/6247380?hl=en. *See also* "Simple guide to conversion tracking for Google App Campaigns," App Radar, available at https://appradar.com/academy/google-app-campaign/conversion-tracking.

51 "Share of ad-selling companies in the total digital advertising revenue in the United States from 2020 to 2025," Statista, May 2023, available at https://www.statista.com/statistics/242549/digital-ad-market-share-of-major-ad-selling-companies-in-the-us-by-revenue/; "Real Time Bidding Market," Markets and Markets, March 2019, available at https://www marketsandmarkets.com/Market-Reports/real-time-bidding-market-4630735.html.

52 "Share of ad-selling companies in the total digital advertising revenue in the United States from 2020 to 2025," Statista, May 2023, available at https://www.statista.com/statistics/242549/digital-ad-market-share-of-major-ad-selling-companies-in-the-us-by-revenue/.

53 *See, e.g.,* "Partner with a creative agency to maximize your ad's impact," Google Ads, available at https://ads.google.com/home/resources/advanced/agency-directory/.

impressions according to the targeted outreach of the advertiser. The DSP allows the agency to purchase ad inventory from multiple publishers.[54]

25. From the publisher's perspective, when a targeted participant lands on the publisher's website or application, the publisher uses an SSP to sell the advertising space or advertising impression[55] to several buyers connected to the SSP. The DSP evaluates the advertising space and determines if it matches the target parameters of the advertiser before formulating a bid price in an auction. When an impression is sold, the ad is sent to the publisher's website/application to be displayed. The advertising exchange functions as an online "brokerage house" for digital advertising space, where the auction process is conducted in real time.[56]

26. Google's ad exchange includes the AdMob platform, where publishers primarily target mobile users.[57] Google AdMob provides app developers with a tool that matches ads with their applications, and automatically handles logistics such as billing advertisers and networks and paying the app developers.[58]

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[54] "What Is Programmatic Advertising and How Does It Work?," Publift, February 3, 2023, available at https://www.publift.com/adteach/what-is-programmatic-advertising; "What is Real-Time Bidding (RTB)? Definition and Importance," Amazon Ads, available at https://advertising.amazon.com/library/guides/real-time-bidding.

[55] An advertising impression is a metric that measures the number of digital views or engagement with an advertisement. Impressions are typically quantified by cost per mille ("CPM"), which is the cost per 1,000 impressions. A CPM of $4, means that a publisher receives $4 whenever an advertisement is displayed on their website/application 1,000 thousand times. Kenton, Will, "What Is an Impression in Online Advertising, How to Count Them," Investopedia, January 4, 2023, available at https://www.investopedia.com/terms/i/impression.asp.

[56] "What Is Programmatic Advertising and How Does It Work?," Publift, February 3, 2023, available at https://www.publift.com/adteach/what-is-programmatic-advertising; "What is Real-Time Bidding (RTB)? Definition and Importance," Amazon Ads, available at https://advertising.amazon.com/library/guides/real-time-bidding.

[57] "Earn more revenue with your apps," Google AdMob, available at https://admob.google.com/home/.

[58] "Earn more revenue with your apps," Google AdMob, available at https://admob.google.com/home/; "How AdMob works," Google AdMob Help, available at https://support.google.com/admob/answer/7356092?hl=en.

27. Google's ad exchange allows advertisers to manually bid for ad space by setting a "maximum cost-per-click" that they are willing to pay if they win an auction.[59] Google also offers a range of automated bidding strategies to help advertisers bid based on their performance goals. Google Ads automatically sets bids for the ads based on an assessment of the likelihood that an ad will result in a click or other advertiser-defined conversion.[60] Different types of automated bidding strategies help advertisers increase clicks, visibility, and conversions.[61] Types of automated bidding strategies include:

a. Maximize clicks: Set bids to get as many clicks as possible;

b. Target impression share: Set bids to show the ads on top of the page for best visibility;

c. Target cost-per-action ("CPA"): Set bids to get as many conversions as possible at the cost set by the advertiser;

d. Target return on ad spend ("ROAS"): Set bids to get as much conversion value at the target return on ad spend set by the advertiser;

e. Maximize conversions / conversion value: Set bids to achieve maximum conversion or conversion value (depending on the goal of the advertiser) within the target budget.[62]

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59 "Manual CPC Bidding," Google Ads Help, available at https://support.google.com/google-ads/answer/2390250?hl=en.

60 "Automated bid strategy: Definition," Google Ads Help, available at https://support.google.com/google-ads/answer/6325042?hl=en.

61 "About automated bidding," Google Ads Help, available at https://support.google.com/google-ads/answer/2979071?hl=en.

62 "About automated bidding," Google Ads Help, available at https://support.google.com/google-ads/answer/2979071?hl=en.

28. Google refers to the strategies in (c) through (e) as "Smart Bidding" strategies, a set of "strategies that use machine learning to optimize for conversions or conversion value" in the auctions.[63]

D. Conversion Measurement in Digital Advertising

29. A key goal of advertising is to encourage consumers to take specific actions, such as making a purchase, signing up for a newsletter, or downloading an app. The act of a user completing these desired actions is typically referred to as a "conversion."[64] Measuring conversions is essential for advertisers to optimize their strategies, allocate resources efficiently, and maximize their return on investment.

30. Advertisers typically rely on multiple platforms or channels to reach their target audiences and therefore need to measure the conversion performance of their campaigns across all of those channels and platforms. By measuring conversion across multiple channels, they can compare the effectiveness of different channels and make data-driven decisions about where to allocate their resources for maximum impact.[65] Although online conversion measurement is more data-intensive and technologically advanced than earlier methods, marketers have long attempted to evaluate the effectiveness of—and attribute business outcomes to—specific marketing activities. For example, George Gallup and Daniel Starch tested recall in the early

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63 "Smart Bidding: Definition," Google Ads Help, available at https://support.google.com/google-ads/answer/7066642?hl=en.

64 "About conversion tracking," Google Ads Help, available at https://support.google.com/google-ads/answer/1722022; "About mobile app conversion tracking," Google Ads Help, available at https://support.google.com/google-ads/answer/6100665; "Conversion tracking: Definition," Google Ads Help, available at https://support.google.com/google-ads/answer/6308?hl=en.

65 *See, e.g.*, "What is adtech and why is it important?," Amazon Ads, available at https://advertising.amazon.com/library/guides/what-is-adtech.

twentieth century by surveying people on the street and comparing their results to data on ad circulation to measure the effectiveness of ads.[66]

31. In the context of Google's mobile app campaigns, "conversion tracking" is a free tool for advertisers that "shows you what happens *after* a customer interacts with your ads – whether they purchased a product, signed up for your newsletter, called your business, or downloaded your app."[67] In this context, "conversions" are counted when "someone interacts with [an advertiser's] ad" and takes an action defined by the advertiser, such as making a purchase or downloading an app.[68] Google notes that the benefits of conversion measurement to advertisers include that advertisers can see "which keywords, ads, ad groups, and campaigns are best at driving valuable customer activity," and therefore understand their "return on investment (ROI) and make better informed decisions about [their] ad spend."[69]

32. Conversion measurement also allows advertisers to assess the performance of their mobile app campaigns across various ad formats and targeting options. Google offers a range of ad formats for app promotion and mobile app installs.[70] By measuring conversions, advertisers can determine which ad formats are most effective at driving the desired user actions and allocate their budget accordingly. Additionally, Google's mobile app campaigns allow advertisers to target specific audience segments on Google's properties, such as Search, Google

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66 Kierlanczyk, Kuba, "A Brief History of Market Research," Kelton, February 4, 2016, available at https://www keltonglobal.com/perspectives/a-brief-history-of-market-research/.

67 "About conversion tracking," Google Ads Help, available at https://support.google.com/google-ads/answer/1722022. Emphasis in original. *See also* "About mobile app conversion tracking," Google Ads Help, available at https://support.google.com/google-ads/answer/6100665.

68 "Conversion: Definition," Google Ads Help, available at https://support.google.com/google-ads/answer/6365.

69 "About conversion tracking," Google Ads Help, available at https://support.google.com/google-ads/answer/1722022.

70 "About mobile app install ads," Google Ads Help, available at https://support.google.com/google-ads/answer/6357635; "Complete guide to Google App Campaigns ad formats and assets," App Radar, available at https://appradar.com/academy/google-app-campaign/ad-assets-and-creatives.

Play, and Google Display Network.[71] By measuring user actions post-click or post-impression, advertisers gain insights into which ads are driving desired outcomes, whether it is app installs, sign-ups, purchases, or other valuable actions.[72] This way, measuring conversions helps advertisers refine their advertising strategies.

33. Google provides conversion measurement for free through Google Analytics for Firebase ("GA4F").[73] Google explains that the GA4F SDK "automatically captures certain key events and user properties, and you can define your own custom events to measure the things that uniquely matter to your business."[74] Google Mobile Ads ("GMA") SDK is a mobile advertising platform that supports Google AdMob and Google Ad Manager.[75] Google explains that the GMA SDK "helps app developers gain insights about their users and maximize ad revenue."[76] Google also allows third parties to provide conversion measurement services for campaigns on Google's ad platforms.

34. Multiple third-party platforms such as AppsFlyer, Kochava, Adjust, and Singular also offer conversion measurement services on Google's ad platforms. Publishers can choose any of these tools, or may use many of them at the same time, to evaluate the effectiveness of their ad

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71 Sönmez, Ekin Gür, "A Complete 2023 Guide to Google App Campaigns and Their True Side," *Replug,* February 20, 2023, https://rplg.io/google-uac/.

72 *See, e.g.,* "About conversion tracking," Google Ads Help, available at https://support.google.com/google-ads/answer/1722022; "Track app conversions with the Google Ads SDK or a server-to-server connection," Google Ads Help, available at https://support.google.com/google-ads/answer/6095881?hl=en; Porter, Katie Sullivan, "The Power of Tracking Pixels…and How to Ensure Their Accuracy," *MarinOne*, September 6, 2022, available at https://www marinsoftware.com/blog/the-power-of-tracking-pixels-and-how-to-ensure-their-accuracy.

73 *See* "Google Analytics for Firebase Free and unlimited app analytics," Firebase, available at https://firebase.google.com/products/analytics; "About conversion tracking," Google Ads Help, available at https://support.google.com/google-ads/answer/1722022.

74 "Google Analytics for Firebase Free and unlimited app analytics," Firebase, available at https://firebase.google.com/products/analytics.

75 "Mobile Ads SDK," Google Ad Manager, available at https://developers.google.com/ad-manager/mobile-ads-sdk; "Overview of apps with Ad Manager," Google Ad Manager Help, available at https://support.google.com/admanager/answer/6238688.

76 "Mobile Ads SDK," Google Ad Manager, available at https://developers.google.com/ad-manager/mobile-ads-sdk.

campaigns.[77] Google noted in June 2020 that "80% of app conversions are tracked using non-Google SDKs," also describing that Google prefers "advertisers use [Google's] lP Firebase SDK, as this tends to give us better data for constructing multi-touch point conversion paths."[78] In October 2022, approximately 55 percent of app conversions were attributable to GA4F.[79]

35. The process of conversion measurement using third-party platforms unfolds as follows. First, apps use a third-party platform's SDK to send events to the third-party platform's server. Second, the third-party platform's server contacts ad networks such as Google and Facebook for these conversions. Third, Google and Facebook respond to the conversion notifying network if there was an ad click and, finally, in the last step, the third-party platform gets click data from the ad networks. In essence, third-party platforms decide which network drove the conversion based on "last click attribution."[80]

E. Attribution Analysis in Digital Advertising

36. The process of identifying and assigning value to a set of campaigns, ads, or other marketing tactics, often referred to as "touchpoints," that contributed in some manner to a conversion, is called attribution.[81] Attribution models help marketers understand the customer journey and how different marketing campaigns or touchpoints (*e.g.*, social media ads, email marketing, organic search, paid search) or in-app events contribute to conversions. This can help

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77 *See* "Set up conversions from Firebase or App Attribution Partners for App campaigns for engagement," Google Ads Help, available at https://support.google.com/google-ads/answer/9260620.

78 GOOG-RDGZ-00056514–531 at 516.

79 *Anibal Rodriguez and Julie Anna Muniz, individually and on behalf of all other similarly situated, vs. Google LLC, et al.*, Defendant Google LLC's Second Supplemental Objections and Responses to Plaintiffs' Interrogatories, Set Six, 3:20-cv-04688, February 14, 2023 ("Interrogatory Response Set Six"), at p. 16.

80 GOOG-RDGZ-00056108–129 at 122.

81 *See* "What is marketing attribution? A beginner's guide," Amazon Ads, available at https://advertising.amazon.com/library/guides/marketing-attribution.

advertisers to optimize their ad spend and focus on the channels or events that are driving the most results.[82]

37. Google distinguishes between various attribution models, such as last click, first click, linear, time decay, position-based, and data-driven.[83] Attribution sharing within Google App Campaigns enables Google Ads to allocate conversions to the appropriate campaign.[84] For example, if an advertiser is running both app install and app engagement campaigns, this feature measures click conversions from app install campaigns and in-app actions from engagement campaigns, allowing for a more precise conversion measurement across different app campaigns running within the same account.[85] Attribution models that assign value to more than one touchpoint are called multi-touch attribution ("MTA") models.[86] MTA models attempt to measure the impact of each touchpoint on the customer journey to a conversion, and assign credit to each touchpoint based on its relative contribution to the conversion.[87]

38. Attribution is thus a fundamental step for advertisers to understand the value of ads and conversions. By understanding the relative value of each touchpoint and channel,

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82 *See* "What is marketing attribution? A beginner's guide," Amazon Ads, available at https://advertising.amazon.com/library/guides/marketing-attribution.

83 *See* "About attribution models," Google Ads Help, available at https://support.google.com/google-ads/answer/6259715?hl=en. Starting in June 2023, Google is removing the ability to select first click, linear, time decay, and position-based attribution models. (*See* "First click, linear, time decay, and position-based attribution models are going away," Google Ads Help, April 6, 2023, available at https://support.google.com/google-ads/answer/13427716?hl=en.)

84 *See* "About attribution sharing for App campaigns," Google Ads Help, available at https://support.google.com/google-ads/answer/9996103?hl=en.

85 *See* "About attribution sharing for App campaigns," Google Ads Help, available at https://support.google.com/google-ads/answer/9996103?hl=en.

86 *See* "Multi-Touch Attribution: What It Is & How To Use It," Marketing Evolution, July 20, 2022, available at https://www.marketingevolution.com/marketing-essentials/multi-touch-attribution.

87 In his deposition, Mr. Steve Ganem described multi-touch attribution as: "A user, in the course of deciding whether to make a purchase, for example, may encounter a number of ads on their journey to do so and may do Google searches along the way, and multi-touch attribution is the process of giving partial credit to each of those advertising touch points instead of just assuming that their last advertising touch point was solely responsible for their eventual conversion, that purchase." Deposition of Steve Ganem, October 28, 2022 ("Ganem Deposition"), p. 35:16–24.

marketers can optimize their marketing mix and improve the effectiveness of their advertising plan and budget.

V. SUMMARY OF MR. LASINSKI'S PROPOSED METHODOLOGIES FOR CALCULATING DISGORGEMENT OF PROFIT AND "ACTUAL" DAMAGES

39. Mr. Lasinski was retained by counsel for Plaintiffs "to provide expert analysis and, if requested, expert testimony regarding the measures of monetary relief that may be appropriate if liability is found against Google for the alleged wrongful conduct described in Plaintiffs' Fourth Amended Complaint."[88]

40. In the Lasinski Report, Mr. Lasinski opines that alleged class-wide disgorgement of profit damages and "actual" damages can be calculated for both putative classes using "common proof."[89] His disgorgement of profit damages calculation relies on financial data produced by Google and Google's internal studies on the financial impact of various privacy settings and controls.[90] Mr. Lasinski's "actual" damages rely on his estimates of damages per device and the number of "Class Member Devices." Mr. Lasinski obtains these estimates using publicly available data on internet usage statistics; survey opinions rendered by Plaintiffs' survey expert (Mr. Mark Keegan), a consumer research panel maintained by Ipsos, and usage data produced by Google.[91]

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88 Lasinski Report, ¶ 9.

89 Lasinski Report, pp. 1–3. Mr. Lasinski notes that he relied on discussions with Jonathan Hochman. Lasinski Report, ¶ 14. Mr. Hochman filed an expert report in this matter on March 22, 2023. Expert Report of Jonathan E. Hochman, March 22, 2023.

90 *See* Lasinski Report, Section 7.

91 *See* Lasinski Report, Section 8.

A. Disgorgement of Profit

41. Mr. Lasinski attempts to quantify disgorgement of profit by measuring revenue in Google's U.S. AdMob, App Promo, and Ad Manager product areas that are purportedly attributable to the alleged wrongful conduct.[92] Mr. Lasinski takes Google's revenue in these product areas and applies discounts purportedly to restrict to revenue associated with users allegedly harmed by the alleged wrongful conduct. He calculates disgorgement of profit damages for the period from July 1, 2016, through December 31, 2022, under two scenarios, which differ with respect to their assumptions regarding Google's liability associated with the use of sWAA-off data.[93]

42. In the first scenario ("Scenario 1"), Mr. Lasinski attempts to calculate disgorgement of profit damages for all of Google's U.S. App Promo, AdMob, and Ad Manager app ads revenue from signed-in, sWAA-off users attributable to conversion measurement.[94] Under his Scenario 1, Mr. Lasinski envisions a but-for world in which Google does not provide conversion measurement services to third-party app developers for sWAA-off users.[95] Mr. Lasinski calculates disgorgement of profit damages of $558.8 million under this first scenario.[96]

43. In the second scenario ("Scenario 2"), Mr. Lasinski attempts to calculate disgorgement of profit damages as the estimate from the first scenario, *plus* disgorgement of profit for all of Google's U.S. AdMob and Ad Manager app ads revenue purportedly attributable

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92 Lasinski Report, ¶ 73. Mr. Lasinski also refers to this category of damages as Google's "unjust enrichment." *See* Lasinski Report, Section 7.

93 Lasinski Report, ¶¶ 75–76.

94 Lasinski Report, ¶¶ 77–78. Conversion measurement is a tool that shows "what happens after a customer interacts with [an advertiser's] ads – whether they purchased a product, signed up for [the advertiser's] newsletter, called [the advertiser's] business, or downloaded [the advertiser's] app." "About conversion tracking," Google Ads Help, available at https://support.google.com/google-ads/answer/1722022.

95 *See* **Section VIII.B** below.

96 Lasinski Report, ¶ 79.

to collecting, saving, and using sWAA-off data for the purposes of serving and monetizing ads to sWAA-off users.[97] Under his Scenario 2, Mr. Lasinski envisions a but-for world in which Google does not provide any advertising-related services for sWAA-off users' devices, including serving ads, measuring impressions and clicks, or providing conversion measurement services to third-party app developers.[98] Mr. Lasinski calculates that disgorgement of profit damages under this second scenario is $664.3 million.[99]

44. To attempt to calculate these damages, Mr. Lasinski begins with the following data to estimate U.S. net revenue for App Promo, AdMob, and Ad Manager for the period over which he estimates damages:

a. **App Promo:**[100] Mr. Lasinski identifies annual U.S. App Promo income statements for 2017 through 2021 that include "Booked Revenues" and traffic acquisition costs ("TAC"), from which Google calculates "Net Revenues" (*i.e.*, revenue net of TAC).[101] He estimates Google's U.S. App Promo net revenue for the period from July 1, 2016, through December 31, 2016, and for 2022 by applying revenue growth rates from other Google materials to the identified 2017 and 2021 net revenue, respectively.[102]

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97 Lasinski Report, ¶ 113. Serving and monetizing ads is a process of taking user traffic to a website or digital property and monetizing that traffic by presenting advertisements to those users in exchange for payment from advertisers. *See, e.g.,* "The Complete Guide to Ad Monetization," Playwire, available at https://www.playwire.com/ad-monetization.

98 *See* **Section VIII.B** below.

99 Lasinski Report, ¶ 114.

100 App Promo, which Google publicly labels "App campaigns," is a type of Google Ads campaign focused on promotion of third-party apps. "About App campaigns," Google Ads Help, available at https://support.google.com/google-ads/answer/6247380?hl=en.

101 Lasinski Report, ¶¶ 84–85.

102 Lasinski Report, ¶ 86. Specifically, Mr. Lasinski estimated Google's U.S. App Promo net revenue for the period from July 1, 2016, through December 31, 2016, using the 2017 net revenue data that he identified and the growth rate in "annualized App Promo revenues between annualized October 2016 and annualized

b. **AdMob:**[103] Mr. Lasinski identifies annual global AdMob income statements for 2018 through 2021 that similarly include "Booked Revenues" and TAC, from which Google calculates "Net Revenues."[104] He first estimates U.S. AdMob net revenue for 2018-2021 by multiplying the identified global AdMob net revenue by his estimate for the portion of 2019 global App Promo gross revenue attributable to the United States.[105] Then, Mr. Lasinski estimates U.S. AdMob net revenue for the period from July 1, 2016, through December 31, 2017, by multiplying by the ratio of 2018 U.S. AdMob and App Promo net revenue to the 2016-2017 U.S. App Promo net revenue he calculates. He estimates 2022 U.S. AdMob net revenue by applying the annual growth rate in Alphabet's 2022 U.S. revenue to the 2021 U.S. AdMob net revenue he calculates.[106]

c. **Ad Manager:**[107] Mr. Lasinski does not identify income statements for Ad Manager. To estimate U.S. Ad Manager net revenue for the period from July 1, 2016, through December 31, 2022, Mr. Lasinski multiplies his estimated U.S.

October 2017 as represented in a November 2019 Google internal presentation." He estimated Google's 2022 U.S. App Promo net revenue "applying the growth in Alphabet's U.S. revenues from 2021 to 2022 to the 2021 U.S. App Promo revenues net of traffic acquisition costs."

103 AdMob is "a mobile ad network and monetization platform for mobile developers who want to earn money from ads, gain actionable insights, and grow their app business." "Compare Ad Manager, AdSense, and AdMob," Google Ad Manager Help, available at https://support.google.com/admanager/answer/9234653?hl=en.

104 Lasinski Report, ¶ 94.

105 Lasinski Report, ¶¶ 95–96. Specifically, Mr. Lasinski estimates the U.S. portion of 2019 global App Promo revenue by dividing the 2019 U.S. App Promo gross revenue, as identified in the App Promo income statements described above, by annualized July 2019 global App Promo gross revenue, as represented in an internal Google presentation.

106 Lasinski Report, ¶ 98. Alphabet, Inc. is the parent company of Google.

107 Ad Manager is an "ad management platform for large publishers" that "provides granular controls and supports multiple ad exchanges and networks, including AdSense, Ad Exchange, third-party networks, and third-party exchanges." "Advertising with Google Ad Manager," Google Ad Manager Help, available at https://support.google.com/admanager/answer/6022000?hl=en.

AdMob net revenue by the 2019 ratio between global Ad Manager and AdMob gross revenue.[108]

45. Mr. Lasinski states that based on discussions with Plaintiffs' technical expert (Mr. Jonathan Hochman), he understands that "some advertisements for apps (*i.e.*, App Promo ads) can be served within apps (*i.e.*, on the AdMob and Ad Manager platform)."[109] Mr. Lasinski attempts to avoid double-counting revenue by adjusting his calculations for "the potential overlap in revenues attributed to AdMob or Ad Manager on the one hand and App Promo on the other."[110] To estimate this overlap, Mr. Lasinski estimates the portion of App Promo gross revenue attributable to "App Display" (*i.e.*, ads served within apps) using data he identified on App Promo's actual and forecasted gross revenue for 2019 through 2021.[111] Mr. Lasinski then breaks down the resulting net revenue overlap into "App Promo-AdMob Overlap" and "App Promo-Ad Manager Overlap" by multiplying by the proportion of U.S. AdMob and App Promo net revenue in 2019.[112]

46. Mr. Lasinski then applies the following adjustments to his net revenue estimates to attempt to calculate net revenue from signed-in, sWAA-off users attributable to conversion measurement:

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108 Lasinski Report, ¶ 106; GOOG-RDGZ-00072319–365 at 328.

109 Lasinski Report, ¶ 99. Mr. Lasinski also states that he has "seen indications of Google personnel referring to the potential overlap in revenues attributed to both AdMob and App Promo as 'AdMob App Promo revenue.'"

110 Lasinski Report, ¶ 99.

111 Specifically, Mr. Lasinski estimates the portion of "Display" revenue attributable to ads served in apps (rather than on the web) using actual 2019 App Promo gross revenue data, and forecasted 2020 and 2021 App Promo gross revenue data. Then, Mr. Lasinski estimated the portion of quarterly App Promo gross revenue attributable to "Display" for the quarters from Q3 2019 through Q4 2021. Mr. Lasinski uses these shares to estimate the share of 2019-2021 U.S. App Promo gross revenue attributable to "App Display." As the period over which Mr. Lasinski estimates damages spans July 1, 2016, through December 31, 2022, Mr. Lasinski uses his calculated 2019 share for the periods prior to 2019, and uses his calculated 2021 share for 2022. *See* Lasinski Report, ¶ 99; Lasinski Report, Schedules 7.1, 8.1, 8.2, and 8.3.

112 *See* Lasinski Report, ¶ 99; Lasinski Report, Schedules 7.1 and 8.1; GOOG-RDGZ-00072319–365 at 328.

a. **Net Revenue from Signed-In Users:** Mr. Lasinski first attempts to calculate net revenue for each of App Promo, AdMob, and Ad Manager that is attributable to signed-in users. To do so, Mr. Lasinski multiplies his net revenue estimates by a factor of 82.2 percent, which is calculated as the share of 2019 App Promo net revenue from signed-in users, according to an internal Google model.[113]

b. **Net Revenue from sWAA-off Accounts:** Mr. Lasinski then attempts to calculate net revenue from signed-in users that are attributable to those with sWAA turned off, by multiplying his calculated annual net revenue from signed-in users by the monthly average share of accounts with sWAA turned off for each period.[114]

c. **Net Revenue Attributable to Conversion Measurement:** Finally, to calculate damages under Scenario 1, Mr. Lasinski attempts to calculate net revenue from signed-in, sWAA-off users that are attributable to conversion measurement. For App Promo, Mr. Lasinski multiplies his calculated net revenue from signed-in, sWAA-off users by the share of "App Campaign revenue attributable to conversion types bid against GA4F."[115] For AdMob and Ad Manager, Mr. Lasinski applies the proportion of "Display Ads" revenue attributable to "conversion-based autobidding" from an internal Google memo discussing the

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[113] *See* Lasinski Report, ¶¶ 88, 101, 109. Mr. Lasinski argues that "[b]ased on [his] discussions with Mr. Hochman, [he] understand[s] that [his] selection of the signed-in metric specific to "App Display" from among other signed-in metrics for other Google products is appropriate because, while App Promo advertisements can be served across Search, YouTube, Web Display, and App Display products, App Promo conversions occur on third-party apps." Lasinski Report, ¶ 88. As I explain in **Section VI**, Mr. Lasinski's assumption is baseless because he only considers the App Display component of App Promo revenue to calculate the proportion of revenue from signed-in users, and uniformly applies that percentage for App Promo to AdMob and Ad Manager.

[114] Lasinski Report, ¶¶ 89, 101, 109. *See also* Lasinski Report, Schedules 2.2, 3.4, and 15.1.

[115] Lasinski Report, ¶ 91; Interrogatory Response Set Six, Supplemental Response to Interrogatory No. 17, pp. 15–16.

potential effects on ad revenue from updates to the Chrome web browser (the "ChromeGuard study").[116]

47. Mr. Lasinski estimates Scenario 2 disgorgement of profit damages as the sum of the damages calculated under Scenario 1 and "an additional measure of AdMob and Ad Manager app ads revenue and attendant profit attributable to the serving and monetization of ads to WAA/sWAA-Off users."[117] Mr. Lasinski does not estimate any additional damages for App Promo under Scenario 2.[118] To estimate additional damages for AdMob and Ad Manager, Mr. Lasinski starts with the remaining net revenue from signed-in, sWAA-off users that he calculated to *not* be attributable to conversion measurement.[119] He then multiplies by a factor of 50.4 percent, calculated as the decrease in 2019 "App Display" net revenue from signed-in users, in a scenario where no users agreed to Google's "Google Ads Personalization" ("GAP") setting, as modeled in an internal Google spreadsheet.[120] *See* **Exhibits 1A-1C** for a summary of adjustments Mr. Lasinski makes in each step in his calculations of disgorgement of profit damages for App Promo, AdMob, and Ad Manager.

B. "Actual" Damages

48. Mr. Lasinski calculates purported class-wide "actual" damages[121] by applying a $3 per device payment to all putative class members under the assumption that this would have

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116 Lasinski Report, ¶¶ 102, 110; GOOG-RDGZ-00188469–491 at 469, 475. As I discuss in **Section IX.B.3** below, Mr. Lasinski's reliance on the ChromeGuard study lacks basis as I understand this analysis tracks the value of blocking third-party cookies for web traffic, not conversion measurement in app usage. Therefore, Mr. Lasinski's methodology is irrelevant to the at-issue allegations.

117 Lasinski Report, ¶ 113.

118 Lasinski Report, ¶ 116.

119 Lasinski Report, ¶¶ 119, 126.

120 Lasinski Report, ¶¶ 120–121, 127; GOOG-RDGZ-00188768 at tab "Matrix." GAP is a setting available on a user's Google Account's Ads Controls page that lets users change ads personalization settings on Google services. Deposition of Greg Fair, October 3, 2022 ("Fair Deposition"), pp. 180:12–181:13.

121 Mr. Lasinski also refers to this category of damages as "restitution" damages. Lasinski Report, ¶ 69.

been the payment "necessary to incentivize an individual to knowingly surrender the choice to keep activity on mobile apps private and allow an organization to track app activity data."[122] Mr. Lasinski's proposed $3 payment per device is based on "the baseline payment to [Ipsos] Screenwise Panel participants of $3 per month for using a Screenwise meter app on a single mobile device (including both smartphones and tablets)."[123] Google has worked with the Ipsos Screenwise Panel, whose members "are paid to voluntarily link their devices, operate a special router, and recruit other members of the household to participate in a comprehensive online data collection process."[124] Quoting Google's privacy policy for the Ipsos Screenwise Panel, the Lasinski Report notes:[125]

> The Google Panel Privacy Policy explains that "[w]hen a Meter is placed on a device, it potentially will collect and record all interactions with that device. For example, when a Meter is placed on your mobile phone, it potentially will record everything you see on your screen and everything you tap, type, swipe, or otherwise input." The policy goes on to further define the scope of the information collected, which includes, among other items, "every web page you've visited and all of your interactions with those web pages," "your use of applications and widgets (collectively 'apps'), software, and operating systems," "the content you see on your screen or device at any given time," and "[i]nformation you provide or otherwise input when visiting websites, using apps or using a TV user interface [including] search terms and personal information you provide to a website, TV user interface, or app, including your name, email address, home/work address, telephone number, Social Security number, or credit card number."

49. Based on produced Google data on sWAA-off accounts, publicly available U.S. demographic data, and data from Plaintiffs' survey expert, Mr. Lasinski estimates that there are

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122 Lasinski Report, ¶¶ 130–131.

123 Lasinski Report, ¶ 151. *See also* Lasinski Report, ¶¶ 141–142. The Lasinski Report also discusses other estimates for "consumers' willingness to pay in their attempts to increase online privacy and/or prevent their own data from being saved" and "research organizations' willingness to pay users to allow for additional data collection" that Mr. Lasinski does not use to estimate actual damages. *See* Lasinski Report, ¶¶ 143–147.

124 Lasinski Report, ¶ 135.

125 Lasinski Report, ¶ 138.

90.9 million putative class members with 162.0 million mobile devices.[126] Mr. Lasinski applies his $3 per device proposed "actual" damages payment to these estimates to calculate total "actual" damages for the proposed classes of $486.0 million.[127]

C. Apportionment of Disgorgement of Profit and "Actual" Damages

50. Mr. Lasinski posits that disgorgement of profit damages and "actual" damages "can be readily apportioned across the two [proposed] Classes" by allocating across the "U.S. market share of Android (*i.e.*, Class 1) and Non-Android (*i.e.*, Class 2) operating systems in mobile devices," and the "share of Class 1 and Class 2 members that are typically 'signed-in' to their Google accounts."[128]

51. Additionally, Mr. Lasinski proposes that disgorgement of profit damages and "actual" damages "could also be readily allocated among [putative] Class members," using "Google data regarding the number of U.S. accounts that were 'ever active'" from July 2016 to July 2020 and the "portion of those accounts for which sWAA was turned off at any time during the same period,"[129] as well as survey data from Mr. Keegan and publicly available U.S. demographic data.[130]

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126 Lasinski Report, ¶¶ 154–155, 159.

127 Lasinski Report, ¶ 161.

128 Lasinski Report, ¶¶ 162, 164, Schedule 1.5. Mr. Lasinski also proposes that "[a]lternatively, [his] analyses of Google's unjust enrichment attributable to the alleged wrongful conduct and actual damages could also be allocated across [the proposed] Classes […], without further adjustment for differences (or lack thereof) in 'signed-in' rates across the [proposed] Classes […] [using] indications of market share." Lasinski Report, ¶ 165.

129 Lasinski Report, ¶¶ 166–167.

130 Lasinski Report, ¶ 167. In addition to being "allocated among [putative] Class members based on [the] number of [putative] Class members," Mr. Lasinski proposes that damages could be allocated based on "the number of sWAA-Off User Months," using "the number of sWAA-Off User Months deemed attributable to each [putative] Class member." Lasinski Report, ¶¶ 166, 174.

VI. MR. LASINSKI OVERSTATES DAMAGES BECAUSE HE FAILS TO EXCLUDE USERS WITH DEVICES THAT DID NOT ALLOW GOOGLE TO KNOW SWAA-OFF STATUS

52. Mr. Lasinski's damages methodologies require an accurate measure of the number of signed-in users that had WAA or sWAA turned off yet were purportedly subject to Google's alleged data collection.[131] However, Mr. Lasinski's methodologies omit the fact that Google has been practically unable to observe an iOS user's sWAA status since the iOS 14 update in September 2020. In fact, Google treats those users as signed out for the purposes of the measurement of the data at issue. As a result, Mr. Lasinski's methodologies overstate damages and include many putative class members who could not have been affected by the alleged wrongful conduct.

53. Specifically, I understand that Plaintiffs allege that the collection of the data at issue and its use by Google for conversion measurement is improper if the user is signed in to a Google account and has the sWAA setting turned off.[132] I further understand that Google's knowledge of a user's sign-in status and its ability to check the WAA/sWAA status of a user who interacts with an app or an ad depends on the presence of certain flags in the data generated by GA4F.[133] But, these flags are available only for a subset of users, not all users as Mr. Lasinski incorrectly assumes.

54. Specifically, Mr. Steve Ganem, Google's Product Manager for Google Analytics, testified that Google can see these flags in activity from Android devices because the signal of a signed-in status is at the operating system level.[134] However, users' iOS devices are signed in

[131] *See, e.g.,* Lasinski Report, ¶¶ 75, 131.
[132] Ganem Deposition, pp. 44:2–19; 48:9–14.
[133] Ganem Deposition, p. 33:10–15.
[134] Ganem Deposition, p. 50:7–14.

only if they install one or more Google-owned and -operated apps (such as Gmail or Google Maps) and are signed in to their Google account while using one of those apps on their iOS device.[135]

55. Mr. Ganem also testified that access to the flags that tell Google if an iOS user is in fact signed in to their Google account have been restricted since the iOS 14 update.[136] As a result, iOS users with at least this version of the operating system are, for practical purposes, signed-out users because Google cannot observe whether or not they are signed in.[137] Internal Google documents also discuss these limitations to Google's ability to measure information such as the data at issue in this matter from iOS 14 users.[138] Therefore, the alleged wrongful conduct does not and cannot occur for these users, and they should be excluded from Mr. Lasinski's calculations.

56. However, Mr. Lasinski's methodologies fail to consider or adjust for this restriction in devices running iOS 14 and above. His calculation of disgorgement of profit damages assumes that the fraction of revenue attributable to signed-in users is 82.2 percent.[139] He obtains this percentage from an internal Google document with data from 2019, prior to the iOS 14 update.[140] However, he applies this percentage to the entirety of the proposed class period, including after the iOS 14 update was released in September 2020.[141] Mr. Lasinski

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135 Ganem Deposition, pp. 50:17–51:3.
136 Ganem Deposition, p. 70:4–19.
137 Ganem Deposition, pp. 71:5–73:3.
138 *See, e.g.,* GOOG-RDGZ-00204559–589 at 561–565, 570; GOOG-RDGZ-00187249–303 at 252–253; GOOG-RDGZ-00199151–191 at 156.
139 Lasinski Report, ¶ 88.
140 *See* GOOG-RDGZ-00188768, tab "Matrix."
141 "iOS 14 is available today," Apple, September 16, 2020, available at https://www.apple.com/newsroom/2020/09/ios-14-is-available-today/.

applies this adjustment to his calculation of disgorgement of profit from App Promo, AdMob, and Ad Manager.[142] As a result, Mr. Lasinski overstates disgorgement of profit damages.

57. Moreover, Mr. Lasinski applies his 82.2 percent adjustment to App Promo, AdMob, and Ad Manager without basis, despite the important distinctions between the functionality and users of these products. Specifically, the 82.2 percent adjustment Mr. Lasinski applies to App Promo, AdMob, and Ad Manager revenue is based on revenue from signed-in users for "App Display."[143] As Mr. Lasinski notes, App Promo advertisements can be "served across Search, YouTube, Web Display, and App Display products."[144] Mr. Lasinski provides no basis (beyond unspecified discussions with Mr. Hochman) for why it is appropriate to apply the 82.2 percent adjustment based specifically on the App Display component of App Promo revenue to all App Promo revenue. Mr. Lasinski also applies this factor to calculate the proportion of revenue from signed-in users for AdMob and Ad Manager, also without basis. App Promo allows app developers to serve ads across Google Search, YouTube, and mobile apps,[145] while AdMob allows app developers to serve ads on mobile apps only[146] and Ad Manager allows them to serve ads through websites, mobile apps, videos, and games.[147] The breakdown of signed-in and signed-out users and attendant revenue could reasonably differ across different platforms (*e.g.,* websites vs. mobile apps) and Google product areas. By applying the 82.2 percent adjustment indiscriminately across App Promo, AdMob, and Ad Manager, Mr. Lasinski fails to consider these distinctions. Moreover, internal Google documents suggest that the

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142 Lasinski Report, ¶¶ 88, 101, 109.
143 Lasinski Report, ¶ 63.
144 Lasinski Report, ¶ 88.
145 Lasinski Report, ¶ 32; "About App campaigns," Google Ads Help, available at https://support.google.com/google-ads/answer/6247380?hl=en.
146 Lasinski Report, ¶ 24; "How AdMob works," Google AdMob Help, available at https://support.google.com/admob/answer/7356092?hl=en.
147 Lasinski Report, ¶ 29; "Advertising with Google Ad Manager," Google Ad Manager Help, available at https://support.google.com/admanager/answer/6022000?hl=en.

relevant fraction of signed-in traffic would be less than 82.2 percent. In an internal presentation, Google states that approximately 70 percent of traffic from ad campaigns is authenticated, *i.e.*, signed in.[148] Therefore, Mr. Lasinski's application of his 82.2 percent adjustment uniformly across all years to App Promo, AdMob, and Ad Manager is unsupported.

58. Mr. Lasinski's estimate of "actual" damages also incorrectly assumes that all putative class members using iOS 14 (or later) are damaged. Mr. Lasinski's calculation of "actual" damages estimates the number of putative class members through December 2022. To do this, he estimates the number of "U.S. Internet Users with Smartphones" and then multiplies this number by the percentage of users with Gmail accounts—estimated from Mr. Keegan's survey—and by the percentage of Google accounts with sWAA turned off *at any time*—obtained from Google data between July 2016 and July 2020, also before the iOS 14 update.[149] Therefore, Mr. Lasinski's "actual" damages methodology also does not account for putative class members who may have only used iOS devices after the iOS 14 update. However, these individuals could not be putative class members because Google could not have received and used the data at issue, including a sWAA-off signal, for these users as alleged by Plaintiffs.

VII. THE TESTIMONY OF NAMED PLAINTIFFS IS INCONSISTENT WITH MR. LASINSKI'S METHODOLOGY TO CALCULATE CLASS-WIDE DAMAGES

59. Both Mr. Lasinski's methodologies for disgorgement of profit damages and "actual" damages imply that the behavior of putative class members towards their interaction with mobile apps using GA4F would have been different had they known about the alleged wrongful conduct. If putative class members' behavior would not be affected by their

[148] GOOG-RDGZ-00177709–741 at 714.
[149] Lasinski Report, ¶ 155.

understanding of the alleged wrongful conduct, then Google would have likely been able to obtain similar profit through an alternative disclosure of its data collection and use (*i.e.,* there would be no unjust gains from the alleged wrongful conduct)[150] and putative class members would have allowed Google to collect the data at issue without the need for any additional compensation (*i.e.,* there would be no "actual" damages, as understood by Mr. Lasinski) or regardless of any emotional distress that they may have suffered.[151]

60. This reasoning also implies that one would have expected the behavior of named Plaintiffs to have changed after they became aware of the alleged wrongful conduct. However, their testimony shows that this has not been the case.

61. For example, Mr. Sal Cataldo testified that, although his understanding of the alleged violation of his privacy "heightened [his] awareness" and made him check his settings more "carefully" when using his smartphone, he could not identify a single behavioral change that he implemented as a result of this understanding.[152]

> Q. I'm asking if you've changed your behavior in any way as a consequence of what you allege Google has been doing to invade your privacy?
>
> A. I would say I'm much more cognizant, I would say, diligent about fastidiously checking all my settings because I've noticed settings get turned on when they weren't on. I've been surprised more often than not, so I feel like I'm constantly having to check and make sure that my privacy is, at least to the extent I can control it, is being controlled. So I don't know that I've changed a specific behavior, but as far as my very heightened awareness, that's certainly, to me, something that I really made a diligent practice of trying to be very aware of what I'm doing and what steps I'm taking because I'm much less trusting.
>
> Q. So just to make sure I understand, in response to -- strike that. In terms of what behavioral changes you've implemented, if any, as a consequence of what you allege to be Google's ongoing violation of your privacy, you've identified as one

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150 *See* **Section VIII.A**.
151 *See* **Section X.A.**
152 Deposition of Sal Cataldo, February 17, 2022 ("Cataldo Deposition"), pp. 42:19–43:25.

change that you check your settings more carefully now than you did before; is that fair to say?

A. That's fair to say.

Q. Can you think of any other behavioral changes that you have implemented as a consequence of what you allege to be Google's ongoing violation of your privacy?

A. Sorry, I thought my audio cut out there. There's none that I can articulate specifically.

62. Similarly, Mr. Anibal Rodriguez testified that he did not change any of his behaviors in terms of interacting with apps other than turning WAA off.[153]

A. And, again, we're -- we're -- we're in this here. And as -- as far as what we're investigating, I didn't want to change any of my -- my -- my activities or -- or what I'm doing if before -- if -- if we're in this investigation, I needed to keep what I had. So my phone still had same apps, still have WAA off, and my -- my behaviors are still the same. In order for this to continue, I want to make sure that you know that I still have the same behaviors.

[...]

Q. Apart from making sure WAA is off, did you change your behavior in the way you interacted with any of the apps after and as a result of the allegations in your July 2020 Complaint?

A. No. The -- it -- it's -- I continue on with the WAA off and same behaviors. I mean, it's -- what I changed was the -- the -- the WAA, making sure it's off, making sure all my e-mails -- because I didn't know that they were on and then make sure they're off. But once I could -- once I did that, I continued on.

63. Mr. Rodriguez did not tell his son to change his behaviors either.[154]

Q. I'm asking: At any point after July 2020, as a result of the allegations in your initial Complaint that you told me you believe to be true, did you ask Nathan to change his behavior with respect to his apps, whether that would be to delete or otherwise use apps differently?

A. As far as apps goes, I didn't tell him to -- to change his behaviors on how to use the apps that he normally uses.

Q. Have you allowed Nathan to install new apps since July 2020?

A. Maybe. Yes. I mean, I don't know which ones.

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[153] Deposition of Anibal Rodriguez, October 16, 2022 ("Rodriguez Deposition"), pp. 83:16–84:1; 327:2–15.
[154] Rodriguez Deposition, pp. 329:11–330:6.

> Q. Have you installed new apps since July 2020?
>
> A. Yes.
>
> Q. Before installing new apps after July 2020, did you investigate whether those apps use Google Analytics for Firebase?
>
> A. No.

64. Moreover, Mr. Rodriguez testified that, when opening a new email account after learning of the alleged wrongful conduct, he chose to create another Gmail account instead of using a different provider, such as Yahoo simply because "it's easier to do a Gmail."[155]

> Q. Why didn't you create a Yahoo account for your two sons instead of a Gmail account?
>
> A. Well -- well, if -- my son -- well, first of all, my son, he -- he -- I didn't create that. That's why you don't see it -- like, my information on there. Because, in fact, it -- that e-mail was not created on 12/31/11. So I don't know what -- how -- how you got that information. It's weird. My -- my son was one year's old. And he's the one that created that. Did I know he did it offhand? I -- I -- you know, I -- I -- that's -- I -- I talked to him about that. We went over the rules. Those are -- you know, we came up with rules. But as far as why didn't I get -- do a -- a Yahoo account, it's because I can put my -- if -- if he has -- if he created it, I'm just going to say: Okay, you created that. Now, you know what? Give me the e-mail so I can put it on my phone so I can see your e-mail. With my other -- with the other e-mails, again, I want -- I wanted it to link to my -- my account. When I say "linked," I mean a way for me to toggle through the different e-mails and also get notifications that, if an e-mail comes up with any of my kids' school or any purchases, they pop up. And that's why I use Gmail. Again, if -- if -- us -- when my regular account was switched off, adding another e-mail, it -- it -- there's this thing where it automatically goes into WAA on. And I wish that -- that didn't happen, where I had to go back and double-check and make sure and make -- you know, turn it off. That's the case. There's -- you know, why I didn't do a Yahoo account? I figure that it's easier to do a Gmail. And I'm the one that's actually looking at any information that's being sent to that e-mail, with -- with the exception to the "awesomenb." [sic]
>
> Q. Is there a reason you didn't want to take the harder route of creating a Yahoo account while you investigated your claims against Google?
>
> A. Because I already have my account already here. I already have my account on Google, my -- my -- my -- my Google account on my device. And, again, it's

[155] Rodriguez Deposition, pp. 311:8–313:9.

easier to just go to Google and press "Add an account," create the e-mail really quick, get your password and such, and then have it in my dashboard to pick. But they don't have access to those e-mails that I created on my phone.

65. Mr. Julian Santiago testified he continued to use the same apps in his smartphone after learning about the alleged wrongful conduct.[156]

Q. Why do you continue to use the Bleacher Report over the last year after finding out that you -- what you believe to be the fact that Google obtains and saves your app interaction data, even though you have web-and-app activity off?

A. I think Bleacher Report is a good app. And I like their journalism and I like their articles and how user friendly it is. And although unsettling that whatever I'm accessing on Bleacher Report may still be getting tracked and collected by Google, despite me having turned web-and-app activity off, which Google clearly states includes services like integrated third-party apps, it's still a good app. And it is highly unsettling but I've continued to use it because they do a good job.

[...]

Q. Between the prior year, at least at the time where you filed your Third Amended Complaint in November 2020, where you had -- or understood these allegations of yours that are in the Complaint, in August 2021 did you take any steps to come up with an alternative to ESPN Fantasy?

A. I suggested to my very stubborn friends who have been using this app for close to 10 years now that maybe we should use another app. And like I said, they're very stubborn and majority rules, therefore we stuck with using the same app.

Q. Surely you told those friends about what happened or what you believed Google to be doing; right?

A. No. Not surely. I simply presented to them, "Hey, why don't we use another app?"

Q. Did you give them a reason as to -- go ahead.

A. I suggested we use another app. I don't need to give my friends reasons.

Q. So you're telling me that you found what Google was doing to be highly offensive, to be screwing you, to be enough to be the case that you wanted to look into a different app and get your whole set of friends to move to a different Fantasy Football app but you didn't tell them that?

[156] Deposition of Julian Santiago, March 7, 2022 ("Santiago Deposition"), pp. 162:6–20, 176:22–178:12, 180:1–11.

A. No. I simply suggested it.

Q. Did you tell them that the suggestion to move to a different Fantasy Football app was because you were concerned Google was obtaining their app interaction data?

A. No, I didn't get into detail about it. I simply suggested it in passing. It didn't stick. But perhaps with the following season, like I said I've been looking into different app alternatives, I will give them a little more reason to.

Q. Did you mention Google at all in your conversations --

A. No.

Q.-- with your friends?

A. No.

[...]

A. Your question was did I continue using MapMyRide?

Q. Yes.

A. Very simply because it's a great app for tracking my bike rides.

Q. Do you think there's an alternative?

A. Sure. There may be other options, yeah.

Q. Have you looked into them?

A. I've tried other bike ride tracking apps, and none of them do as good a job in my opinion as MapMyRide does.

66. Finally, Ms. Susan Harvey testified that she did not remember deleting any apps, researching whether any apps used GA4F, or using any apps differently as a result of learning about the alleged wrongful conduct.[157]

Q. After you found out about the actions that you allege in this lawsuit, did you delete any apps?

A. I'm sure there's been apps that have went off my phone because I switched phones. But I -- I don't know. Maybe if I didn't use something anymore, I would

[157] Deposition of Susan Harvey, October 29, 2022 ("Harvey Deposition"), pp. 244:16–245:1; 248:13–19.

> take it off. But I -- I was sort of curious what -- what was going to be find out. That's why I seeked attorneys.
>
> Q. Did you investigate which apps use Google Analytics for Firebase?
>
> A. That's not for me to do.
>
> [...]
>
> Q. Ms. Harvey, since filing this case, have you used any apps differently than you did before?
>
> A. No. I'm trying to find out what's going on. It's being investigated right now. They're checking everything out. So if I stopped using those things, then nothing would be found out, would it?

67. Ms. Harvey also testified that she continued to use Gmail accounts on Android, and created new Gmail accounts, after learning of the allegations against Google.[158]

> Q. If there were unauthorized transactions on a Gmail account, why did you make a new Gmail account?
>
> A. Excuse me?
>
> Q. I guess I'm just curious. If there are these unauthorized transactions that were happening through a Gmail account and there were concerns about that actual account, why did you choose Gmail as the new service to make your new e-mail address?
>
> A. Because it's what you use with Android.
>
> Q. Did you ever consider making a non-Gmail account?
>
> A. I've had other non-Gmail accounts. I use Gmail. It's what I use. It goes with the Android device.

68. In summary, the four named Plaintiffs expressed in their respective depositions that they did not change their behavior when using their mobile devices and interacting with mobile apps, which is inconsistent with Mr. Lasinski's methodologies of damages.

[158] Harvey Deposition, pp. 118:23–119:12.

VIII. MR. LASINSKI'S DISGORGEMENT OF PROFIT DAMAGES ANALYSIS ENVISIONS UNREALISTIC BUT-FOR SCENARIOS THAT INFLATE DAMAGES

69. Mr. Lasinski's disgorgement of profit damages analysis assumes unrealistic but-for world scenarios with unnecessarily onerous restrictions on Google's conversion measurement and ad serving for sWAA-off accounts. Specifically, Mr. Lasinski's Scenarios 1 and 2 envision but-for worlds in which Google and third parties would take unrealistic steps to be consistent with Plaintiffs' theory of harm and damages. These scenarios also ignore any possible behavioral responses from either Google, ad publishers, or users that may result from Mr. Lasinski's proposed changes in Google's data collection and use practices. As a result, Mr. Lasinski's analysis fails to quantify any claimed damages correctly, and his disgorgement of profit damages are overstated.

A. Mr. Lasinski Ignores the Possibility of a But-For World with Alternative Disclosures from Google

70. A realistic alternative to Mr. Lasinski's Scenarios 1 and 2 is a scenario that assumes no change to Google's data collection and use procedures, and instead assumes that the relevant terms of service and/or privacy disclosures pertaining to sWAA include the alleged wrongful conduct. In other words, in this "alternative disclosure" scenario, Google would have disclosed even more explicitly its conversion measurement practices for sWAA-off accounts.[159] In the face of such a policy, consumers might have chosen differently whether and the extent to which to utilize the WAA setting, and/or other Google services, commensurate with their appetite for such data collection and the benefits they derive therefrom. Such a change in

[159] I understand from counsel that such modified disclosures would cure the alleged wrongful conduct at issue in this matter.

consumer demand for Google services would consequently change Google's revenue and profit. In this framework, the appropriate measure of the value of the alleged wrongful conduct to Google would be the difference between Google's profit in the real world and the hypothetical profit it would have earned in this "more disclosure" but-for world. This alternative approach would necessarily embed changes in consumer behavior arising in response to the change in policy, which Mr. Lasinski ignores.

71. This "alternative disclosure" scenario reframes the damages analysis as one of estimating the impact of a policy change on consumer behavior. This is an active area of economic research that leverages well established and widely accepted analytical approaches. A common approach in this academic literature is a difference-in-differences technique, which exploits existing variation in policy across firms, geographies, or time to identify an effect of interest.[160] In this case, Mr. Lasinski might have leveraged variation in technology firms' data privacy policies and the impact of changes other firms made to their privacy policies to estimate the impact for Google. Mr. Lasinski makes no attempt to do any such exercise. Instead, Mr. Lasinski's disgorgement of profit damages effectively assumes that all sWAA-off users stop using Google's services, which is inconsistent with the named Plaintiffs' testimony in this matter, as I discuss below.

72. The academic literature also commonly uses surveys to quantify changes in demand and willingness to pay. A properly designed survey could elicit the degree to which a

[160] For example, Goldfarb and Tucker (2011) use a difference-in-differences design to study the effect of privacy regulations in the EU on the effectiveness of online advertising. *See* Goldfarb, Avi, and Catherine E. Tucker, "Privacy Regulation and Online Advertising," *Management Science*, Vol. 57, No. 1, 2011, pp. 57–71. Similarly, Johnson et al. (2019) use a difference-in-differences design to study the effect of consumers opting into the AdChoices program on revenue from online ads. *See* Johnson, Garrett A., Scott K. Shriver, and Shaoyin Du, "Consumer privacy choice in online advertising: Who opts out and at what cost to industry?," *Marketing Science*, 2020, Vol. 39, Issue 1, 33–51.

change in data privacy policy would affect a user's behavior. Fielding the survey with an appropriate panel of survey participants would allow for valid inference regarding the broader population that the survey participants represent. Neither Mr. Lasinski nor Mr. Keegan, Plaintiffs' survey expert, makes any attempt to conduct such an analysis to measure user behavior directly or characterize potential heterogeneity of user preferences.

73. Had he conducted an analysis of this "alternative disclosure" scenario, Mr. Lasinski would likely have found that the impact of the alleged wrongful conduct on consumer demand and Google revenue and profit to be minimal. First, I understand that users opt into WAA on and sWAA on at a high rate in the actual world, suggesting the cost-benefit analysis of allowing Google to save WAA data to their Google accounts, versus receiving improved user experience weighs in favor of disclosure.[161] The named Plaintiffs' deposition testimony corroborates this view, as it shows that the four named Plaintiffs did not substantially change their behavior with respect to their usage of mobile apps or Google services after learning of the alleged wrongful conduct.[162]

74. Further, I understand that the putative class members consented to the privacy policies of the third-party apps that used GA4F for conversion measurement, and that these privacy policies allowed for the third-party app developer to measure conversions—including by contracting such measurement out to Google via GA4F—if they chose. For example, AccuWeather's user privacy statement specifies that "AccuWeather and third-party vendors, including Google, may use first-party cookies (such as the Google Analytics cookies) … to: (a) inform, optimize and serve ads based on a user's past visits to AccuWeather Sites or (b) report

[161] For example, Mr. Lasinski's own analysis demonstrates that over 85 percent of users opted into sWAA on status in 2022. *See* Lasinski Report, Figure 21.

[162] *See* **Section VII.**

how Your ad impressions, other uses of ad services, and interactions with these ad impressions and ad services are related to visits to AccuWeather Sites."[163] Dr. Hoffman, another expert for Google in this matter, opines that it makes sense from a user interface (or UI) design perspective for disclosures related to data collection pertaining to third-party apps to be found in the third-party apps' user agreements.[164] She opines that in addition to subsections in Google's Privacy Policy, third-party app user agreements serve as another source of information that communicates to users that Google is collecting and saving information related to their activity on such apps.[165]

75. I also understand that many app developers who use GA4F also use multiple other analytics providers and disclose multiple analytics providers in their privacy policies.[166] However, in this matter, Plaintiffs claim to have been harmed *only* by Google's receipt of their data while their sWAA setting was off and *not* by any of these other analytics providers' simultaneous collection of similar data for similar purposes.

76. To measure the impact of a but-for "alternative disclosure" scenario on Google's revenue, one could consider consumer behavior toward app developers who use multiple analytics providers, or who only use analytics providers other than Google. These other analytics providers do not have a separate relationship with the user that includes a WAA or sWAA

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163 "Privacy Policy," AccuWeather, August 21, 2020, available at https://www.accuweather.com/en/privacy. *See also* "Privacy Policy," Applebee's, April 1, 2023, available at https://www.applebees.com/en/privacy-policy; "Privacy Policy - United States, DoorDash - General Privacy Policy," DoorDash, January 3, 2023, available at https://help.doordash.com/legal/document?type=cx-privacy-policy&region=US&locale=en-US.

164 Expert Report of Donna L. Hoffman, May 31, 2023 ("Hoffman Report"), Section VIII.B.

165 Hoffman Report, Section VIII.B.3.

166 *See, e.g.,* "Privacy Policy," Little Caesars, January 1, 2023, available at https://littlecaesars.com/en-us/legal/privacy-policy ("We may use Google Analytics, Adobe Analytics, or other Service Providers for analytics services"); "Target Privacy Policy," Target, December 31, 2022, available at https://www.target.com/c/target-privacy-policy/-/N-4sr7p ("Analytics services such as Site Catalyst by Adobe Analytics, Google Analytics and Crazy Egg provide services that analyze information regarding visits to our websites and mobile application(s).").

control like the one at issue in this matter. When installing such an app, the user chooses whether to agree to the app developer's privacy policy or refrain from using the app. If it were true that putative class members have an economic preference against sharing the data at issue with Google in particular, developers and publishers might observe consumers choosing not to use apps that share the data at issue with Google in this "alternative disclosure" but-for scenario.

77. The existence of this type of consumer behavioral response has been studied in other markets. For example, a joint study by McKinsey and NielsenIQ shows that some consumers show a preference for environmentally sustainable products, which creates an incentive for firms to develop sustainability initiatives as a way of making their products more appealing to those customers and grow sales.[167] Consumers have been shown to prefer products from such sustainability-minded manufacturers even if the intrinsic characteristics of the underlying products are unchanged. That is, consumers prefer products from such manufacturers even when the characteristics of the product do not change when the manufacturer begins producing it in a "carbon neutral" facility, much the same way that the features of an app do not change when the conversions on the ads it displays are measured by a third party instead of Google.

78. This example illustrates that considering the possible behavioral responses of consumers surrounding these choices is necessary to reliably estimate the impact of changes to Google's profit in the but-for world in this matter. However, Mr. Lasinski does not attempt to perform this type of analysis. Considering this "alternative disclosure" but-for world underscores infirmities in Mr. Lasinski's analysis, which makes no effort to measure how the behavior of

[167] "Consumers care about sustainability—and back it up with their wallets," McKinsey and Company, February 6, 2023, available at https://www mckinsey.com/industries/consumer-packaged-goods/our-insights/consumers-care-about-sustainability-and-back-it-up-with-their-wallets.

consumers, publishers, and developers would change in the absence of the alleged wrongful conduct. As I discuss above, this scenario might result in publishers and developers still using Google's ad platform—such that any impact on Google's profit might be small or negligible—but aided by third-party analytics providers.

B. Mr. Lasinski Ignores that Third Parties Would Still Provide Conversion Measurement Services in the But-For World

79. Mr. Lasinski's Scenario 1 envisions a but-for world in which Google does not provide conversion measurement services to third-party app developers for sWAA-off users. Mr. Lasinski's Scenario 2 further envisions a but-for world in which Google does not provide any advertising related services for sWAA-off users' devices, including serving ads or measuring impressions or clicks. As I discuss below, conversion measurement (including for sWAA-off users) would likely continue in the but-for worlds contemplated by Mr. Lasinski, and Google would likely continue to earn advertising revenue. Mr. Lasinski fails to consider these features and, as a result, his analysis assumes an unrealistic but-for world. In particular, Mr. Lasinski fails to consider the revenue that Google would have generated in the but-for-worlds where Google does not engage in the alleged wrongful conduct.

80. In the absence of GA4F conversion measurement for sWAA-off users under Mr. Lasinski's Scenario 1, Google would still need to charge advertisers for advertising on Google's network, and app developers would still need to know how their ad campaigns were performing for all users who interacted on their apps. As I explain in **Section IV** above, some form of conversion measurement or attribution measurement has been an essential part of advertising campaigns since long before the age of online ads because advertisers wish to know how effective their ads campaigns are in order to adjust their campaigns and allocate their

advertising budgets to maximize the returns on their ad spending. In this context, it is reasonable to expect advertisers to react to the loss of conversion measurement provided by Google in Mr. Lasinski's hypothetical but-for world by utilizing similar services from other providers. Indeed, most of them already do so.[168] This is especially true in a context where conversion measurement for online ads is a service that Google provides for free currently.[169]

81. Mr. Lasinski also ignores that Apple implemented its own conversion measurement in iOS14: SKAdNetwork.[170] Apple's solution provides advertisers with attribution even in the absence of the user or device identifier by providing the advertiser with aggregated conversion information.[171] Not only can app developers and advertisers leverage this solution for their iOS apps, but Google could also provide its own similar solution.[172] Google explains that "[a]s the industry moves away from individual identifiers, particularly with the rollout of Apple's ATT policy, multiple forms of measurement have emerged for iOS app install campaigns," where Google's own conversion modeling uses "Google's AI to help you assess the performance of your campaigns when a subset of conversions can't be directly linked to ad interactions."[173]

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168 *See* GOOG-RDGZ-00056514–531 at 516, stating that "80% of app conversions are tracked using non-Google SDKs" and GOOG-RDGZ-00202698–713 at 699–700 showing the Facebook SDK has higher penetration than GA4F.

169 *See* "About conversion tracking," Google Ads Help, available at https://support.google.com/google-ads/answer/1722022.

170 *See* "SKAdNetwork," Apple Developer, available at https://developer.apple.com/documentation/storekit/skadnetwork.

171 "SKAdNetwork," Apple Developer, available at https://developer.apple.com/documentation/storekit/skadnetwork ("The information in the postback that Apple cryptographically signs doesn't include user- or device-specific data. It may include values from the ad network and the advertised app if providing those values meets Apple's privacy threshold"). *See also* "Best practices guide: Drive better performance and measurement for iOS App campaigns," Google Ads Help, available at https://support.google.com/google-ads/answer/10384955?hl=en ("Apple's new attribution solution for campaign measurement, helps app advertisers measure their ad activity, such as impressions, clicks, and app installs, on an aggregated level").

172 "Best practices guide: Drive better performance and measurement for iOS App campaigns," Google Ads Help, available at https://support.google.com/google-ads/answer/10384955?hl=en.

173 "Best practices guide: Drive better performance and measurement for iOS App campaigns," Google Ads Help, available at https://support.google.com/google-ads/answer/10384955?hl=en.

These changes suggest that conversion measurement can be done by Google (or other parties) while respecting users' privacy settings, showing that the but-for world envisioned by Mr. Lasinski ignores reality.

82. Further, in Mr. Lasinski's Scenario 1, Google would still have generated revenue from advertising spending from ad interactions other than conversions, such as impressions and clicks.[174] However, Mr. Lasinski fails to consider this revenue. In addition, under both Scenario 1 and Scenario 2, app developers would likely have relied on third-party measurement tools instead of Google's GA4F to measure the effectiveness of their advertising campaigns. I understand that these changes in advertisers' behavior would not lead to any changes in how sWAA-off users' data are used by Google. App developers could—and in fact already do—use third-party measurement tools to measure conversions, impressions, and clicks for all users.[175] For instance, as of January 2019, over 30 percent of the advertisers on Google's ad network did not utilize Google's GA4F SDK.[176] Further, as of June 2020, over 80 percent of the conversions were tracked through non-Google SDKs.[177] Under Mr. Lasinski's scenarios, app developers would likely use non-GA4F, third-party conversion measurement in greater numbers than they already do in the real world.

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174 *See, e.g.,* Deposition of Belinda Langner, December 15, 2022 ("Langner Deposition"), pp. 213:15–23. ("In the context of ads, advertisers are able to target for users who are more likely to do a specific event which can include some of these various ways that are listed in the slide, and Google makes money by driving more -- through the ad impressions and the ad clicks that we drive to -- to help app advertisers reach their marketing goals.")

175 Interrogatory Response Set Six, Supplemental Response to Interrogatory No. 17, pp. 15–16.

176 GOOG-RDGZ-00177709–741 at 710, 712. The presentation notes that the Goal of [redacted] is to "drive adoption of [GA4F] SDK," and that Google would like "GA4F SDK to be preferred bidding option, advertisers can continue to use 3P platforms like AppsFlyer for attribution." The presentation further demonstrates that only seven percent of the advertisers utilize GA4F SDK to bid ads, and that most of the advertisers do not use GA4F SDK to bid ads. *See also* Deposition of Rahul Oak, November 18, 2022, pp. 109:21–111:17.

177 GOOG-RDGZ-00056514–531 at 516.

83. The Impact Tracker Model upon which Mr. Lasinski relies unrealistically ignores changes in behavior by Google, developers, users, and advertisers in response to regime shifts in the but-for world. Since most app developers already use third-party conversion measurement tools instead of, or in addition to, GA4F, they may simply react by dropping the use of GA4F while continuing to use Google's ad platform.[178] At the same time, Google could try to adapt by measuring attribution in alternative ways in order to continue to serve ads, measure conversions and engagement, and generate revenue in the absence of conversion measurement through GA4F. An appropriate damages analysis would have to consider Google's revenue under the alternative that a third-party conversion measurement tool were used instead of GA4F. Mr. Lasinski's damages analysis fails to do so.

84. Moreover, this third party could also be created and managed by Alphabet itself. For example, Google's parent company, Alphabet, could own a company separate from Google that would offer all conversion measurement services in a similar manner to the third-party conversion measurement platforms that I reference above and enforce strict firewalls to ensure only sWAA-on data were shared with Google and sWAA-off data were shared only with the third-party app from which the data were generated. Users, app developers, and advertisers would likely see no change in their experience as this arrangement would closely resemble the real world, including that sWAA-off data would not be used to personalize advertising. The only difference would be that the firewall would be legal and structural rather than an internal policy forbidding personalized advertising, and the servers used to log conversion activity and ad interactions would be run by a separate legal entity. That is to say, any decrease in advertiser ad spend on Google's advertising network would likely be small.

[178] GOOG-RDGZ-00056514–531 at 516.

85. Furthermore, Google offers conversion modeling as a solution to increasing browser restrictions, regulatory updates, and customer privacy expectations that "force the industry to move away from third-party cookies on the web and device IDs in apps."[179] Conversion modeling uses machine learning to "quantify the impact of marketing efforts when a subset of conversions can't be tied to ad interactions."[180] Google explains that "[m]odeled conversions use data that doesn't identify individual users to estimate conversions that Google is unable to observe directly."[181] When Google receives ad interactions and online conversions without the linkage between the two, conversion modeling helps determine whether a Google ad interaction led to the online conversion.[182] Further, I understand that the use of modeled conversions for sWAA-off users would not necessarily instantiate the alleged violations of privacy claimed to be suffered by Plaintiffs in this matter. The development of conversion modeling suggests that Google would be able to leverage alternative solutions in the absence of GA4F conversion measurement for sWAA-off users under Mr. Lasinski's damages scenarios.[183]

IX. MR. LASINSKI'S METHODOLOGY FOR CALCULATING DISGORGEMENT OF PROFIT DAMAGES REQUIRES UNRELIABLE ASSUMPTIONS THAT OVERSTATE DAMAGES

86. As I explain in **Section V.A**, Mr. Lasinski attempts to quantify disgorgement of profit damages for Google's AdMob, App Promo, and Ad Manager products between

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179 "Your guide to conversion modeling: Introduction," Google Ads Help, available at https://support.google.com/google-ads/answer/12445061?hl=en.

180 "Your guide to conversion modeling: Introduction," Google Ads Help, available at https://support.google.com/google-ads/answer/12445061?hl=en.

181 "About modeled online conversions," Google Ads Help, available at https://support.google.com/google-ads/answer/10081327?hl=en.

182 "About modeled online conversions," Google Ads Help, available at https://support.google.com/google-ads/answer/10081327?hl=en.

183 de Freitas, Henrique, "Conversion modeling through Consent Mode in Google Ads," Google Marketing Platform, April 15, 2021, available at https://blog.google/products/marketingplatform/360/conversion-modeling-through-consent-mode-google-ads/.

July 1, 2016, and December 31, 2022, under two scenarios, which differ with respect to their assumptions regarding Google's liability associated with the use of sWAA-off data.

87. Even putting aside the fact that Mr. Lasinski's scenarios are unrealistic as I discuss above, Mr. Lasinski's methodology for calculating disgorgement of profit damages is unreliable. In this section, I show that Mr. Lasinski's methodology overstates damages because:

a. it incorrectly assumes that all owners of Google accounts with sWAA off were exposed in equal manner to the alleged wrongful conduct and fails to consider lower account activity—and lower revenue—associated with sWAA-off accounts;

b. it incorrectly assumes that Google earns revenue directly through conversion measurement;

c. it overstates the fraction of Google's revenue that can be attributed to sWAA-off users by assuming that all users—regardless of sWAA status—are equally likely to interact with online ads;

d. it uses inaccurate or irrelevant measures of revenue attributable to signed-in users;

e. it misinterprets the status of the WAA and sWAA settings in putative class members' Google accounts;

f. it uses a speculative and unsupported estimate for the share of revenue attributable to conversion measurement based on the ChromeGuard study;

g. it fails to consider any revenue Google would have generated in the but-for worlds in which there is no alleged wrongful conduct; and

h. it underestimates the costs that should be deducted from Google's at-issue revenue.

A. Mr. Lasinski's Proposed Calculation of Disgorgement of Profit Damages Overstates the Alleged Harm Suffered by sWAA-Off Users

88. Mr. Lasinski assumes without basis that all owners of Google accounts with sWAA off were harmed, and therefore overstates his claimed disgorgement of profit damages.

89. Specifically, Mr. Lasinski multiplies the estimated U.S. App Promo, AdMob, and Ad Manager revenue net of TAC by (i) "Share of Revenue from Signed-In Users" and (ii) "Share of Monthly Accounts with sWAA Off" to compute the purported portion of the revenue that is attributable to signed-in users who had sWAA off.[184] By simply applying such adjustments to the associated revenue, Mr. Lasinski incorrectly assumes that all owners of Google accounts with sWAA off were exposed in equal manner to the alleged wrongful conduct. Thus, Mr. Lasinski's analysis fails to consider lower account activity—and lower revenue—associated with sWAA-off accounts. In particular, Mr. Lasinski does not consider that Google generates revenue from user traffic and users' interactions with ads, rather than simply higher numbers of user accounts. Users with more activity will have more exposure to ads, so they would be expected to generate more revenue. However, Mr. Lasinski ignores this fact.

90. Based on my review of available data produced by Google,[185] users who turn sWAA off are less likely to see or interact with ads, all else equal. For example, **Figure 1** illustrates the difference in ad engagement between sWAA-on accounts and sWAA-off accounts during a subset of the proposed class period. While sWAA-off accounts accounted for approximately 13.9 percent of monthly active accounts from March 2022 to May 2022, they

[184] Lasinski Report, Schedules 2.2, 3.4, and 4.4.
[185] Interrogatory Response Set Six, Second Supplemental Response to Interrogatory No. 17, pp. 19–24.

accounted for only 9.4 to 9.5 percent of ad impressions[186] and 6.1 to 6.5 percent of ad clicks.[187] By adjusting advertising revenue by the share of monthly accounts with sWAA off rather than a measure of ad engagement (and thus revenue),[188] Mr. Lasinski implicitly—and incorrectly—assumes that sWAA-on users and sWAA-off users engage with the same number of ads in the same way. However, **Figure 1** illustrates instead that users who have sWAA turned off are less likely to participate in advertising related activities (*i.e.*, see or click on ads).

Figure 1[189]

Date	Share of Monthly Accounts with sWAA Off (Lasinski Report)	sWAA Opt-out Rate on Google Display Advertising Stack (Impressions)	sWAA Opt-out Rate on Google Display Advertising Stack (Clicks)
Mar-22	13.94%	9.45%	6.16%
Apr-22	13.92%	9.52%	6.08%
May-22	13.94%	9.39%	6.52%

B. Mr. Lasinski's Calculation of Disgorgement of Profit Damages Incorrectly Assumes That Google Earns Revenue Through Conversion Measurement

91. Mr. Lasinski's flawed disgorgement of profit damages analysis inappropriately attributes Google revenue associated with the use of sWAA-off data to the alleged wrongful conduct. Google explained that "[GA4F] app measurement data does not directly generate revenue for Google" and that "[t]he product itself operates at a significant net loss."[190] GA4F

[186] Ad impressions show how often an ad is shown to users, counted each time an ad is shown on a search result page or other site on the Google Network. *See* "Impressions: Definition," Google Ads Help, available at https://support.google.com/google-ads/answer/6320?hl=en.

[187] Ad clicks are counted when a user clicks on an ad. Google explains that clicks can help advertisers understand how well the ad is appealing to people who see it. *See* "Click: Definition," Google Ads Help, available at https://support.google.com/google-ads/answer/31799?hl=en.

[188] Mr. Lasinski adjusts App Promo, AdMob, and Ad Manager revenue in 2022 by 13.87 percent, which is Mr. Lasinski's estimate for the average for full-year 2022. Lasinski Report, Schedule 13.1.

[189] Lasinski Report, Schedule 13.2; Interrogatory Response Set Six, Second Supplemental Response to Interrogatory No. 17, pp. 21–24. I understand that "Google Search Advertising Stack" data are generated based on Google's "sampledAdEventsQueries" log that indicates WAA and sWAA status alongside ad interactions, such as advertising views and clicks, on App Campaigns designated app-install campaigns. Interrogatory Response Set Six, Second Supplemental Response to Interrogatory No. 17, p. 19.

[190] Interrogatory Response Set Six, Supplemental Response to Interrogatory No. 17, p. 14.

instead "helps Google's revenue-generating functions because it leads to a 'virtuous cycle' in the parlance of the GA4F team that helps developers make their apps perform better, which in turn leads to increased user engagement, which in turn leads to app developers investing more in their apps and into advertising their apps."[191] In addition, through a process called attribution, Google "serves as an accountant for the app developer/advertiser" to make an educated guess about whether an interaction with that advertiser's advertisement came from the same device or user as a conversion (recorded by GA4F or third-party conversion measurement tools), depending on the types of information available. Advertisers then use these data to measure the effectiveness of the ad campaign,[192] which can help them to refine their advertising and to determine how much advertising budget to spend in the future on similar advertising.

92. As I discuss in **Section IV.E**, an attribution model determines how credit for sales and conversions is assigned to the various touchpoints in a user's conversion path, and Google uses MTA models to assign credit to each point of contact between a user and an advertiser such that the advertiser can measure how much influence each channel had on a sale. Google utilizes certain "consented-to" data from the GA4F and GMA SDKs to improve its attribution models, which allows advertisers to better measure the effectiveness of the ads. Contrary to the assumptions underlying Mr. Lasinski's analysis, I understand Google generates no revenue from

[191] Interrogatory Response Set Six, Supplemental Response to Interrogatory No. 17, p. 14. *See also* GOOG-RDGZ-00030019–023 at 019–020.

[192] Interrogatory Response Set Six, Supplemental Response to Interrogatory No. 17, pp. 15–16; GOOG-RDGZ-00030019–023 at 019–020. "Through the concepts of 'data sharing' and 'linking', the data for a given app becomes actionable … The intent is to create a virtuous cycle."

conversion measurement;[193] the advertiser has already made a bidding decision and committed a budget by the time conversion measurement takes place.[194]

1. Mr. Lasinski ignores that Google generates revenue from advertising and ad personalization, not from conversion measurement

93. Mr. Lasinski ignores the fact that Google does not use app measurement data from sWAA-off users for personalization.[195] As Mr. Hochman acknowledges, Google's "Footprints" data repository contains "app activity data generated by signed-in users *whose WAA and sWAA settings are on*."[196] Because all personalization must to be done from Footprint "[f]or most activity data (including WAA, etc),"[197] Mr. Lasinski assumes that Google generates revenue based on conversion measurement itself by calculating "Share of Revenues Attributable to Conversion Tracking."[198] However, Google does not generate *any* revenue directly from app measurement data collected through GA4F.[199] Instead, online advertising platforms such as Google or Meta are paid to serve ads at the advertiser's behest.[200] A Google presentation

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193 Interrogatory Response Set Six, Supplemental Response to Interrogatory No. 17, p. 14.

194 *See* "Choose your bid and budget," Google Ads Help, available at https://support.google.com/google-ads/answer/2375454?hl=en; "About conversion tracking," Google Ads Help, available at https://support.google.com/google-ads/answer/1722022.

195 I understand that Google does not associate data from sWAA-off users with the users' GAIA IDs that enable conversion measurement and providing personalized ads to those GAIA IDs. Instead, Google uses pseudonymous identifiers for sWAA-off users to pseudonymize the data. Interrogatory Response Set Six, Supplemental Response to Interrogatory No. 17, p. 15. "Google does not use app measurement data generated while a user is signed in and has sWAA off … for personalized advertising." *See also* Langner Deposition, pp. 29:5–9, 31:7–32:22. "A. When a user has turned off WAA, or Web and App Activity, Google respects the user's settings and we do not use any of the WAA-off associative data for personalization in the ad systems … When WAA is off and there are a number of other additional conditions, Google does not use that data for conversion measurement associated with the specific GAIA ID."

196 Hochman Report, ¶¶ 142–143 (emphasis added); Deposition of David Monsees, September 15, 2022, pp. 90:11–13, 133:18–134:7 ("Footprints primarily serves as a personalization infrastructure" and that "there isn't a reason for [Google] . . . to store [sWAA-off] information in Footprints").

197 GOOG-RDGZ-00118124–129 at 125.

198 Lasinski Report, Schedules 3.3 and 4.3.

199 Interrogatory Response Set Six, Supplemental Response to Interrogatory No. 17, p. 14 ("Google Analytics for Firebase (GA4F) app measurement data does not directly generate revenue for Google").

200 *See, e.g.,* "Get the Most Out of Your Bid in the Facebook Ad Auction," Facebook Business, January 16, 2018, available at

discussing the integration of Firebase and AdMob explains that personalization helps "developers optimize their app experience and monetization with Ads."[201] Mr. Lasinski does not clarify or provide evidence on how Google generates revenue through the alleged wrongful conduct (*i.e.*, measuring conversions from sWAA-off users), given that Google does not use data from sWAA-off users for ad personalization. Given that these users would have no economic interest in revenue Google earns from facilitating advertisers and app developers to offer personalized ads, Mr. Lasinski's damages methodology is flawed and unsupported.

2. Mr. Lasinski ignores that GA4F can be substituted by other conversion measurement tools in Google's App Campaign business

94. To encourage adoption of GA4F and generate value from sWAA-on users' data, Google provides the GA4F service to app developers and advertisers at no charge. This is an investment that Google makes at the cost of generating no value from sWAA-off users.[202] This investment is economically rational. In many industries, firms will provide specific products and services at a loss, but charge for other related products.[203] For example, a gaming console manufacturer (*e.g.*, Microsoft) typically sells its console (*e.g.*, Xbox) at a loss relative to

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https://webcache.googleusercontent.com/search?q=cache%3AKbNJo6yNpVkJ%3Ahttps%3A%2F%2Fwww.facebook.com%2Fbusiness%2Fnews%2Fget-the-most-out-of-your-bid-in-the-facebook-ad-auction&cd=4&hl=en&ct=clnk&gl=us; "Ad Revenue: What Is and How to Increase it?," CodeFuel, June 29, 2021, available at https://www.codefuel.com/blog/ad-revenue/.

201 GOOG-RDGZ-00067439–474 at 450.

202 Interrogatory Response Set Six, Supplemental Response to Interrogatory No. 17, p. 14 ("Google Analytics for Firebase (GA4F) app measurement data does not directly generate revenue for Google. The product itself operates at a significant net loss.").

203 Banton, Caroline, "Loss Leader Strategy: Definition and How It Works in Retail," Investopedia, May 27, 2021, available at https://www.investopedia.com/terms/l/lossleader.asp. *See also* GOOG-RDGZ-00030019–023 at 019–020; Interrogatory Response Set Six, Supplemental Response to Interrogatory No. 17, p. 14 ("Google Analytics for Firebase (GA4F) … operates at a significant net loss. However, GA4F helps Google's revenue-generating functions because it leads to a 'virtuous cycle.'").

investments in the console's development and manufacturing.[204] The console manufacturer bears this loss in order to grow its console user base in an attempt to recover its losses from consoles through lower cost, higher margin offerings such as game software and subscription services.[205] In this case, sWAA-off users are analogous to console buyers who purchase very few games, who benefit from the existence of users who buy more games and/or services. Likewise, sWAA-off users benefit greatly from improvements in app quality and user experience driven by analytics based on data generated by sWAA-on users.

95. Similarly, the means through which conversion measurement takes place (either through Google via GA4F or through other third-party conversion measurement tools) may not impact how advertisers serve personalized ads through Google's App Campaign product. I understand that conversion measurement tools can be substitutes in Google's App Campaign business,[206] and Google's App Campaign revenue would not necessarily be impacted by app developers' or advertisers' choice of conversion measurement tool. In this way, GA4F's role in Google's App Campaign business is akin to a replaceable component of a composite device, such as the RAM chip in a laptop computer. While laptops cannot function without *any* RAM chip, laptops typically do not require a certain brand of RAM chip—they merely require a compatible RAM chip. As I discuss in **Section VIII.B**, Mr. Lasinski fails to consider that GA4F could be substituted by other third-party conversion tracking tools, and instead assumes that

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204 Nightingale, Ed, "Microsoft loses up to $200 on each Xbox console sold," Eurogamer, November 1, 2022, available at https://www.eurogamer.net/microsoft-loses-up-to-200-on-each-xbox-console-sold; Banton, Caroline, "Loss Leader Strategy: Definition and How It Works in Retail," Investopedia, May 27, 2021, available at https://www.investopedia.com/terms/l/lossleader.asp.

205 Nightingale, Ed, "Microsoft loses up to $200 on each Xbox console sold," Eurogamer, November 1, 2022, available at https://www.eurogamer.net/microsoft-loses-up-to-200-on-each-xbox-console-sold.

206 *See* "Track app conversions with third-party app analytics," Google Ads Help, available at https://support.google.com/google-ads/answer/7382633?hl=en (explaining that app conversion data from third-party app analytics provider could be imported). *See also* GOOG-RDGZ-00056514–531 at 516 (showing that 80 percent of the conversions are tracked through third-party trackers as of June 2020).

advertisers would choose to reduce their ad expenditures in response to absence of conversion measurement through GA4F rather than migrating to third-party conversion measurement tools. Mr. Lasinski assumes, without basis, that Google's revenue would decrease without conversion measurement through GA4F, thereby overstating disgorgement of profit damages.

3. Mr. Lasinski's estimate of the share of revenue attributable to conversion measurement based on the ChromeGuard study is unsupported and speculative

96. Mr. Lasinski's calculation of disgorgement of profit damages for AdMob and Ad Manager assumes, without basis, that 52 percent of AdMob and Ad Manager revenues are attributable to conversion tracking that Google would no longer generate in the but-for world. Mr. Lasinski's source is the ChromeGuard study, which appears to label this figure "conversion-based autobidding proportion."[207] Mr. Lasinski assumes, again without basis, that this 52 percent represents a proportion of revenue from Display Ads that can be attributed to conversion measurement. Mr. Lasinski provides no further explanation for why this "conversion-based autobidding proportion" is an adequate measure of "the portion of the [at issue] revenues attributable to conversion tracking."[208] His prior discussion of the ChromeGuard study also provides no explanation or support for this methodology as it does not even mention the words "conversion-based autobidding."[209]

97. I have seen no evidence in the record—nor has Mr. Lasinski presented any—that the ChromeGuard study is an appropriate reference for measuring any purported revenue

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[207] Lasinski Report, Schedules 3.3 and 4.3; GOOG-RDGZ-00188469–491 at 475. Similarly, earlier in the ChromeGuard study, the document also explains that "~45% of Search Ads revenue can be attributed to conversion-based autobidding," *See* GOOG-RDGZ-00188469–491 at 473.

[208] Lasinski Report, ¶ 102.

[209] Lasinski Report, ¶ 68.

attributable to conversion tracking in third-party apps on mobile devices. I understand that the purpose of the ChromeGuard study was to evaluate the impact on "Google and the Ads ecosystem" of *all* third-party cookies being blocked by default on Incognito mode in Chrome.[210] The privacy setting at issue in this matter is different. Mr. Lasinski's damages methodology claims to calculate *solely* the effect of Google not being able to "collect, save, and/or use WAA/sWAA-Off Data" for conversion measurement on Google's revenue.[211] However, Google provides advertisers with the ability to measure these conversions for free.[212] Developers can also measure conversions using third-party services such as AppsFlyer, Kochava, Adjust, and Singular.[213] In June 2020, Google noted that 80 percent of app conversions were tracked using non-Google SDKs.[214] Mr. Lasinski provides no basis—nor have I seen any documents in the case record—to support extrapolating a percentage of revenue using "conversion-based autobidding proportion" from the ChromeGuard study (which studies a distinct scenario in which I understand third-party cookie data from users in Incognito mode would not be available to Google or any other provider of conversion measurement services) to this matter. The ChromeGuard study measures a fundamentally different revenue stream, and it is not clear from the Lasinski Report or the case record why Mr. Lasinski assumes the ChromeGuard study may

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210 GOOG-RDGZ-00188469–491 at 469.

211 Lasinski Report, ¶ 92.

212 *See* "About conversion tracking," Google Ads Help, available at https://support.google.com/google-ads/answer/1722022.

213 *See* "Set up conversions from Firebase or App Attribution Partners for App campaigns for engagement," Google Ads Help, available at https://support.google.com/google-ads/answer/9260620; "About tracking app conversions with an App Attribution Partner," Google Ads Help, available at https://support.google.com/google-ads/answer/12961402?hl=en. *See also* "Google AdMob ad revenue attribution configuration," AppsFlyer Help Center, May 14, 2023, available at https://support.appsflyer.com/hc/en-us/articles/360006951817-Google-AdMob-ad-revenue-attribution-configuration.

214 GOOG-RDGZ-00056514–531 at 516.

be used to estimate any purported revenue loss if Google were not able to use sWAA-off data for conversion measurement.[215]

98. Mr. Lasinski relies on the ChromeGuard study to estimate the share of AdMob and Ad Manager revenue attributable to conversion measurement using the "conversion-based autobidding proportion" for "Display Ads" revenue.[216] However, I understand that Google's ChromeGuard study measured the impact of blocking all third-party cookies in Chrome's Incognito mode on Google's revenue.[217] As such, I understand that the analysis in the ChromeGuard study evaluates the impact of a change in conversion measurement with respect to *web browser traffic*, and not *mobile app usage*. Mr. Lasinski fails to provide a basis for why the ChromeGuard study's methodology or findings are at all relevant to his analysis in this matter.

99. I understand that Google's Display Ads revenue would include revenue for both "App Display" and "Web Display,"[218] while the "Display Ads" category specified in the ChromeGuard study would include only "Web Display." Furthermore, the Impact Tracker Model that Mr. Lasinski relies on demonstrates that the revenue composition of signed-in and signed-out users are considerably different between App Display and Web Display ads, indicating different user behaviors with regard to the two types of ads.[219] Therefore, Mr. Lasinski's use of

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215 Similarly, Mr. Hochman opines that, in the context of Google's use of sWAA-off data for attribution measurement, that "[s]ome studies have reported a 10% - 20% performance uplift when advertising platforms are integrated with GA4F." Hochman Report, ¶ 282. To support this statement, he cites an internal Google presentation that, in the context of discussing Google Ads and Firebase, states "10%-20% performance uplift based on first studies." GOOG-RDGZ-00196222–259 at 244. However, he provides no further explanation or support for what "uplift" means or whether it would be relevant to the revenue at issue in this matter.

216 Lasinski Report, ¶¶ 102, 111. For App Promo revenue, Mr. Lasinski applies Google's representation of the share of "App Campaign revenue attributable to conversion types bid against GA4F." Lasinski Report, ¶ 91; Interrogatory Response Set Six, Supplemental Response to Interrogatory No. 17, p. 16.

217 GOOG-RDGZ-00188469–491 at 469–470.

218 *See* GOOG-RDGZ-00188768, tab "Matrix," (showing revenue from two categories of display ads).

219 GOOG-RDGZ-00188768, tab "Matrix." In 2019, Web Display net revenue from signed-in users represented 38.7 percent of total net revenue ($315 million of $814 million), compared to the share of App Display net revenue from signed-in users of 82.2 percent ($355 million of $432 million).

the revenue attributable to conversion measurement from the ChromeGuard study for AdMob (where ads are served on mobile apps only)[220] and Ad Manager (where ads are served on websites, mobile apps, videos, and games)[221] lacks basis. Further, as I explain in **Section V.A**, Mr. Lasinski takes the revenue specific for App Display to estimate the "Share of Revenue from Signed-In Users," which is inconsistent with his choice to estimate the proportion of revenue from conversion measurement specific to Web Display in the ChromeGuard study.

100. Therefore, Mr. Lasinski's methodology to calculate disgorgement of profit for AdMob and Ad Manager incorrectly attributes revenue from conversion-based autobidding to conversion measurement, a service that Google offers for free to app developers and advertisers. As a result, Mr. Lasinski's methodology is unsupported and fails to measure any profit that results from the alleged wrongful conduct.

C. Mr. Lasinski's Calculation of Disgorgement of Profit Damages Overstates Google Revenue Attributable to sWAA-Off Users and Data

1. Mr. Lasinski's estimates for the share of revenue from signed-in users is inaccurate and irrelevant

101. Even assuming *arguendo* that Mr. Lasinski's choice to use separate discounts for "Share of Revenue from Signed-In Users" and "Adjusted Share of Monthly Accounts with sWAA-Off" is appropriate, his methodology to estimate "Share of Revenue from Signed-In Users" lacks support. Mr. Lasinski estimates this factor from a Google internal analysis entitled

[220] "How AdMob works," Google AdMob Help, available at https://support.google.com/admob/answer/7356092?hl=en.

[221] "Advertising with Google Ad Manager," Google Ad Manager Help, available at https://support.google.com/admanager/answer/6022000?hl=en.

"Narnia 3 Revenue Impact Tracker Model" ("Impact Tracker Model"),[222] which I understand analyzed the revenue impact of user consent rates to GAP.[223] Mr. Lasinski's calculation and his reliance on the Impact Tracker Model suffer from multiple flaws, including (i) a misplaced focus on European—rather than U.S.—user patterns and revenue and (ii) a failure to measure the impact of changes to the sWAA setting that is at issue in this matter. In part because of these flaws, Mr. Lasinski overestimates any disgorgement of profit damages.

102. Mr. Lasinski acknowledges that the Impact Tracker Model was specific to Europe.[224] Inferences about user patterns and revenue trends in Europe may not be applicable to the U.S. For instance, the share of Android operating system in Europe is 67.2 percent, compared to 40.5 percent in the U.S. as of 2021.[225] This marked difference in mobile operating system market share suggests that usage of Google services might differ between the two geographies. Mr. Lasinski makes no effort to determine whether his assumption regarding the share of revenue from signed-in users is accurate.

103. Further, I understand that the Impact Tracker Model measured the impact to Google's revenue of turning GAP off.[226] GAP is a control setting separate from WAA or sWAA

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222 GOOG-RDGZ-00188768, tab "Matrix." *See also* Lasinski Report, Schedule 15.1. Mr. Lasinski calculates the share of revenue from signed-in users as App Display revenue net of TAC from signed-in users ($355 million) *divided by* the App Display revenue net of TAC from all users ($432 million) in 2019.

223 Lasinski Report, ¶¶ 51, 60; GOOG-RDGZ-00188655; GOOG-RDGZ-00188768, tab "Summary." Note that Mr. Lasinski refers to GAP as "GAIA Ads Personalization." "GAIA" refers to Google Accounts and ID Administration, which I understand is Google's primary identifier for any particular signed-in user across all Google products. *See* "Cloud Connect: Google Apps," Google Help Center, available at https://www.google.com/support/enterprise/static/gsa/docs/admin/70/admin_console_help/cloud_google_apps html.

224 Lasinski Report, ¶ 60.

225 "Market share of leading mobile operating systems in Europe from 2010 to 2021," Statista, January 2022, available at https://www.statista.com/statistics/639928/market-share-mobile-operating-systems-eu/; "Market share of mobile operating systems in the United States from January 2012 to March 2023," Statista, March 2023, available at https://www.statista.com/statistics/272700/market-share-held-by-mobile-operating-systems-in-the-us-since-2009/. For the United States, the market share as of December 2021 is used.

226 GOOG-RDGZ-00188655; GOOG-RDGZ-00188768, tab "Summary."

that is available on a user's Google Account's Ads Controls page and concerns ads personalization rather than measurement of web and app activity history.[227] Therefore, users could choose to enable or disable ads personalization regardless of their sWAA setting.[228] Putting aside the fact that Mr. Lasinski has not investigated whether the Impact Tracker Model is relevant to the impact of turning off sWAA (rather than GAP), users that opt out of sWAA are typically less likely to interact with online ads than users opting into sWAA, as I discuss in **Section IX.A**. Therefore, Mr. Lasinski's choice to apply "Share of Revenue from Signed-In Users" based on the Impact Tracker Model uniformly to U.S. sWAA-on and sWAA-off users without considering differences between European and U.S. users or user traffic level is flawed.

2. Mr. Lasinski's methodology for estimating revenue attributable to sWAA-off accounts would overstate damages

104. When calculating the revenue attributable to sWAA-off users, Mr. Lasinski fails to use data on ads traffic by sWAA-off users that Google provided. Instead, he simply multiplies the proportion of the number of sWAA-off accounts to the number of active accounts to the respective App Promo, AdMob, and Ad Manager revenue. As a result, Mr. Lasinski assumes that sWAA-off accounts generate the same level of revenue per account compared to sWAA-on accounts. However, as I discuss in **Section IX.A** above, data provided by Google demonstrate that sWAA-off users are less likely to engage with advertising activities than sWAA-on users.[229] Google's internal research has also found that WAA-on users are "twice as engaged … than

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227 Fair Deposition, pp. 180:12–181:15.

228 If a user has set sWAA off, they will not receive personalized ads. However, even if a user has set sWAA on, if they set GAP off, then they also would not receive personalized ads. *Anibal Rodriguez and Julie Anna Muniz, individually and on behalf of all other similarly situated, vs. Google LLC, et al.*, Defendant Google LLC's Fourth Supplemental Responses and Objections to Plaintiffs' Interrogatories, Set One, 3:20-cv-04688, November 5, 2021 ("Interrogatory Response Set One"), Fourth Supplemental Response to Interrogatory No. 1, pp. 23–24; Interrogatory Response Set Six, Supplemental Response to Interrogatory No. 17, p. 15.

229 *See* **Figure 1** above.

users without personalization enabled."[230] Therefore, WAA-on users would likely contribute higher traffic and therefore generate higher level of revenue per user, in contrast to Mr. Lasinski's assumption. As I discuss in **Section IX.A**, when accounting for sWAA-off traffic volume, Mr. Lasinski attributes a share of revenue from sWAA-off users ranging between 13.9 percent and 69.1 percent,[231] but this share is likely much lower. As I discuss above, the share of revenue attributable to sWAA-off accounts from March 2022 and May 2022 would fall from approximately 13.9 percent (based on the simple proportion of sWAA-off accounts to active accounts)[232] to 9.5 percent or less (based on the proportion of ad impressions from sWAA-off accounts) or 6.5 percent or less (based on the proportion of ad clicks from sWAA-off accounts) when adjusting for ad engagement.[233] Based on these data, I have adjusted Mr. Lasinski's damages analysis to illustrate the potential impact on damages of accounting for levels of ad engagement from sWAA-off users in **Section IX.E** below.

D. Mr. Lasinski's Calculation of Disgorgement of Profit Damages Underestimates Google's Costs

105. I understand from counsel that a disgorgement of profit damages calculation should consider net profit after accounting for all relevant costs associated with generating the revenue associated with alleged wrongful conduct.[234] Mr. Lasinski's calculation of disgorgement of profit damages deducts only TAC, and fails to deduct any other costs associated with

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230 GOOG-RDGZ-00046896–933 at 903.

231 Lasinski Report, Schedule 13.1.

232 Mr. Lasinski adjusts App Promo, AdMob, and Ad Manager revenue in 2022 by 13.87 percent, which is Mr. Lasinski's estimate of the average for full-year 2022. Lasinski Report, Schedule 13.1.

233 *See* **Figure 1**.

234 *See also* "Liu v. SEC: Supreme Court Affirms SEC's Disgorgement Authority But Imposes Limitations," White & Case, June 24, 2020, available at https://www.whitecase.com/insight-alert/liu-v-sec-supreme-court-affirms-secs-disgorgement-authority-imposes-limitations (The Supreme Court held that the disgorgement awards should be "capped to the wrongdoer's net profits" and "rather than requiring wrongdoers to disgorge their total ill-gotten proceeds, lower courts must now deduct any legitimate business expenses from the amount of ill-gotten gains in order to calculate the amount eligible for disgorgement").

generating the relevant revenue at issue.[235] I understand that Google produced data for a host of other costs (beyond just TAC) associated with the product areas that Mr. Lasinski considered. Mr. Lasinski's disgorgement of profit damages calculations inappropriately ignore these additional cost data. By ignoring these costs, Mr. Lasinski improperly inflates his disgorgement of profit damages estimate.

106. Based on my review, the financial statements that Google produced in this matter provide a detailed breakdown of costs of services and operating expenses for App Promo and AdMob.[236] For App Promo, Mr. Lasinski fails to consider the costs of services including "Machine/Network," and "Other COS," and operating expenses including "EngPM," "GBO," "Marketing," "G&A," and "Technical Infrastructure."[237] Similarly, Mr. Lasinski fails to account for the costs of additional services and operating expenses for AdMob.[238] **Figure 2** below summarizes the App Promo and AdMob costs for which Mr. Lasinski failed to consider.[239] Operating profit for App Promo ranged from 19.2 percent and 56.7 percent of net revenue and operating profit for AdMob ranged from 37.7 percent and 53.8 percent of net revenue. Therefore, by using net revenue instead of operating profit, Mr. Lasinski's disgorgement of profit damages are substantially inflated.

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235 Lasinski Report, p. 1 (stating that Mr. Lasinski's disgorgement of profit damages are "measured in revenue net of traffic acquisition costs").

236 I understand that the financials for Ad Manager are not available. Mr. Lasinski's damages calculation assumes that the Ad Manager revenue would be 34 percent of AdMob revenue. Lasinski Report, ¶ 106.

237 GOOG-RDGZ-00184247; GOOG-RDGZ-00185744. "EngPM" represents costs related to engineers and product managers that would be accounted towards App Promo. Langner Deposition, p. 224:14–18. "GBO" typically represents "Global Business Operations," which I understand as costs related to Google's global operations that would be accounted towards App Promo. Wilkinson, Amy, and Nick Hubbard, "Google's Global Business Organization: Managing Innovation at Scale," 2020, available at https://www.gsb.stanford.edu/faculty-research/case-studies/googles-global-business-organization-managing-innovation-scale. "G&A" represents general and administrative costs that include costs such as real estate and finance. *See also* Langner Deposition, p. 226:14–18.

238 GOOG-RDGZ-00187666; GOOG-RDGZ-00187665.

239 For detailed breakdown of the costs, *see* **Exhibits 2A–2B**.

Figure 2[240]

App Promo P&L

(Values in millions USD)	2017	2018	2019	2020	2021
Net Revenue (Booked – TAC)	**490**	**713**	**860**	**1,160**	**2,001**
Machine/Network	73	77	77	93	108
Other COS	9	23	31	34	69
Gross Margin	**408**	**614**	**752**	**1,032**	**1,824**
Total Op Ex	314	407	442	511	690
Operating Profit	**94**	**207**	**310**	**521**	**1,134**
Operating Profit as % of Net Revenue	*19.2%*	*29.0%*	*36.0%*	*44.9%*	*56.7%*

AdMob P&L

(Values in millions USD)	2018	2019	2020	2021
Net Revenue (Booked – TAC)	**1,192**	**1,450**	**1,818**	**2,948**
Machine/Network	180	211	235	288
Other COS	36	51	53	104
Gross Margin	**976**	**1,188**	**1,530**	**2,556**
Total Op Ex	527	597	689	970
Operating Profit	**449**	**590**	**841**	**1,586**
Operating Profit as % of Net Revenue	*37.7%*	*40.7%*	*46.3%*	*53.8%*

107. Based on his understanding from an undisclosed conversation with Mr. Hochman, Mr. Lasinski claims that "it would be unreasonable to assume that any meaningful measure of incremental costs was associated with the alleged wrongful conduct, and that Google's infrastructure-heavy business would preclude any meaningful cost savings from the envisioned change to such a small portion of its operations."[241] It is unclear how Mr. Lasinski developed this assumption. Mr. Hochman repeats this assumption but also does not explain how he developed it.[242] In fact, Google would likely reduce its firm-wide expenses in the but-for world envisioned by Mr. Lasinski where Google would not generate any revenue from the alleged wrongful conduct.[243] In other words, Google would be in a new "equilibrium" and would change its fixed

[240] GOOG-RDGZ-00184247; GOOG-RDGZ-00185744; GOOG-RDGZ-00187666; GOOG-RDGZ-00187665.
[241] Lasinski Report, ¶ 85, footnote 156.
[242] Hochman Report, ¶ 269.
[243] As I discuss in **Section IX.B.1** above, Google does not generate revenue from conversion measurement. But, if the Court were to grant disgorgement of profit damages associated with the revenue that Mr. Lasinski incorrectly characterizes as revenue from conversion measurement, then such revenue should be adjusted for all costs that Google would allocate to the business.

costs and investments commensurately. Mr. Lasinski fails to provide any economically reasonable justification for ignoring Google's own profit and loss statements. I have adjusted Mr. Lasinski's damages analysis to reflect operating expenses in **Section IX.E** below.

E. Correcting Certain Flaws in Mr. Lasinski's Methodology Would Substantially Lower His Disgorgement of Profit Damages Estimates

108. In this section, I correct certain of the errors in Mr. Lasinski's disgorgement of profit damages estimates using available data, putting aside fundamental flaws that invalidate this approach to disgorgement of profit damages (*e.g.*, Mr. Lasinski's misconception that Google earns revenue from conversion measurement). These recalculations take Mr. Lasinski's methodology largely at face value and provide illustrative estimates of the potential impact of certain of the critiques that I discuss above.[244]

1. Correcting Mr. Lasinski's methodology for estimating revenue attributable to sWAA-off accounts

109. As I discuss in **Section IX.A** above, Mr. Lasinski focuses on sWAA-off user account counts and fails to use data on ad engagement by sWAA-off users that Google produced. As I discuss above, the share of revenue attributable to sWAA-off accounts from March 2022 and May 2022 would fall from approximately 13.9 percent (based on the simple proportion of sWAA-off accounts to active accounts)[245] to 9.5 percent or less (based on the proportion of ad impressions from sWAA-off accounts) or 6.5 percent or less (based on the proportion of ad

[244] To be clear, it is not my opinion that there are any class-wide damages in this matter. But, if the Court were to accept Mr. Lasinski's damages framework and grant disgorgement of profit damages associated with the revenue that Mr. Lasinski incorrectly characterizes as revenue from conversion measurement, then Mr. Lasinski's damages estimates would require certain adjustments to correct methodological errors. The calculations presented here are illustrative estimates of such corrections.

[245] Mr. Lasinski adjusts App Promo, AdMob, and Ad Manager revenue in 2022 by 13.87 percent, which is Mr. Lasinski's estimate for the average for full-year 2022. Lasinski Report, Schedule 13.1.

clicks from sWAA-off accounts) when adjusting for ad engagement.[246] To illustrate the impact on damages of adjusting for traffic from sWAA-off accounts, I estimate the overall adjustment to Mr. Lasinski's disgorgement of profit damages between July 2016 and December 2022 using the sWAA opt-out rates among impressions and clicks in Google's Advertising Stack between March 2022 and May 2022.

110. As demonstrated in **Exhibit 3**, sWAA-off accounts represented 13.93 percent of total accounts but only 9.45 percent of total ad impressions and 6.25 percent of total ad clicks on Google Display Advertising between March 2022 and May 2022. In **Exhibits 4A–4C**, I adjust Mr. Lasinski's App Promo, AdMob, and Ad Manager revenue attributable to sWAA-off accounts by multiplying by the ratio of 9.45 to 13.93 based on ad impressions and 6.25 to 13.93 based on ad clicks.[247] When applying only these adjustments, Mr. Lasinski's disgorgement of profit damages under Scenario 1 decrease from $558.8 million to $379.2 million (32.1 percent decrease) based on ad impressions, and to $250.8 million (55.1 percent decrease) based on ad clicks.[248] Similarly, Mr. Lasinski's disgorgement of profit damages under Scenario 2 decrease from $664.3 million to $450.8 million (32.1 percent decrease) based on ad impressions, and to $298.2 million (55.1 percent decrease) based on ad clicks.[249]

2. Correcting for costs which Mr. Lasinski fails to consider

111. As I discuss in **Section IX.D** above, Mr. Lasinski's disgorgement of profit damages fail to account for other costs that should be deducted from revenue. Because Google

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246 *See* **Figure 1**.

247 That is, sWAA-off accounts' share of total ad impressions on Google Display Advertising was 67.86 percent of sWAA-off accounts' share of total accounts on average during this period. Likewise, sWAA-off accounts' share of total ad clicks on Google Display Advertising was 44.89 percent of sWAA-off accounts' share of total accounts on average during this period.

248 *See* **Exhibit 4D**.

249 *See* **Exhibit 4E**.

would reduce its firm-wide expenses in the but-for world envisioned by Mr. Lasinski, it is reasonable to deduct other cost of services and operating expenses from App Promo, AdMob, and Ad Manager revenue.[250] Based on other cost of services and operating expenses in **Exhibits 2A–2B**, I calculate the operating profit of App Promo from 2017 to 2021 and of AdMob from 2018 to 2021. Then, I multiply the App Promo operating profit margin from 2017 by Mr. Lasinski's estimated revenue for 2016 (for July–December) and the App Promo operating profit margin from 2021 to Mr. Lasinski's estimated revenue for 2022 (**Exhibit 5A**). Similarly, for AdMob, I multiply AdMob's operating profit margin from 2018 by Mr. Lasinski's estimated revenue for 2016 (for July–December) and 2017, and AdMob's operating profit margin from 2021 to Mr. Lasinski's estimated revenue for 2022 (**Exhibit 5B**). To calculate the operating profit for Ad Manager, I follow Mr. Lasinski's methodology to calculate Ad Manager revenue by taking 34 percent of AdMob revenue and multiplying the operating profit margin for AdMob to Ad Manager revenue (**Exhibit 5C**).

112. After replacing revenue net of TAC with operating profit for App Promo, AdMob, and Ad Manager, Mr. Lasinski's disgorgement of profit damages under Scenario 1 decrease from $558.8 million to $277.1 million (a reduction of 50.4 percent). Similarly, Mr. Lasinski's disgorgement of profit damages under Scenario 2 decrease from $664.3 million to $325.1 million (a reduction of 51.1 percent). *See* **Exhibit 5D**.

[250] As I explain in **Section IX.D**, Google would reduce its firm-wide expenses in the but-for world envisioned by Mr. Lasinski where Google would not generate any revenue from the alleged wrongful conduct.

3. Correcting Mr. Lasinski's methodology for estimating revenue attributable to sWAA off accounts and costs he fails to consider

113. I next calculate illustrative disgorgement of profit damages by applying both corrections above. Following Mr. Lasinski's methodology to calculate disgorgement of profit damages (but applying the adjustments above), I first calculate operating profit after adjusting for ad engagement for App Promo, AdMob, and Ad Manager in **Exhibits 6A–6C**. I then calculate adjusted disgorgement of profit damages under Mr. Lasinski's Scenario 1 and Scenario 2 in **Exhibits 6D–6E**. After correcting certain errors in Mr. Lasinski methodology, Mr. Lasinski's disgorgement of profit damages under Scenario 1 would decrease from $558.8 million to $188.0 million (66.4 percent decrease) when applying ad engagement adjustments based on ad impressions and to $124.4 million (77.7 percent decrease) when applying ad engagement adjustments based on ad clicks. Similarly, Mr. Lasinski's disgorgement of profit damages under Scenario 2 would decrease from $664.3 million to $220.6 million (66.8 percent decrease) when adjusting for ad impressions and to $145.9 million (78.0 percent decrease) when adjusting for ad clicks.

114. Finally, as I discuss in **Section VI** above, Mr. Lasinski fails to consider or adjust for limitations to Google's ability to measure information from users of iOS 14 and beyond. Given that iOS 14 was launched in September 2020,[251] I apply further adjustments to Mr. Lasinski's disgorgement of profit damages in 2021 and 2022 to reflect the market share of iOS in mobile operating systems.[252] In particular, I apply reductions of 58.6 percent and 56.7 percent to

[251] "iOS 14 is available today," Apple, September 16, 2020, available at https://www.apple.com/newsroom/2020/09/ios-14-is-available-today/.

[252] "Market share of mobile operating systems in the United States from January 2012 to March 2023," Statista, March 2023, available at https://www.statista.com/statistics/272700/market-share-held-by-mobile-operating-systems-in-the-us-since-2009/. I apply these adjustments for illustrative purposes. It is possible that some devices running iOS may not have been updated to iOS 14 in 2021 and 2022.

disgorgement of profit damages for 2021 and 2022, respectively.[253] After further applying this correction in **Exhibits 7D–7E**, Mr. Lasinski's disgorgement of profit damages under Scenario 1 would decrease from $558.8 million to $111.9 million (80.0 percent decrease) when applying ad engagement adjustments based on ad impressions and $74.0 million (86.8 percent decrease) when applying ad engagement adjustments based on ad clicks. Similarly, Mr. Lasinski's disgorgement of profit damages under Scenario 2 would decrease from $664.3 million to $135.7 million (79.6 percent decrease) when adjusting for ad impressions and $89.8 million (86.5 percent decrease) when adjusting for ad clicks.[254] A summary of the adjustments I make to Mr. Lasinski's disgorgement of profit damages is shown in **Exhibit 8**.

X. MR. LASINSKI'S METHODOLOGY FOR CALCULATING "ACTUAL" DAMAGES IS UNRELIABLE AND WOULD OVERSTATE DAMAGES

115. Mr. Lasinski claims that "actual damages can be determined as a function of the payments necessary to incentivize an individual to knowingly surrender the choice to keep activity on mobile apps private and allow an organization to track app activity data."[255] He further opines that "the baseline payment to Screenwise Panel participants of $3 per month for using a Screenwise meter app on a single mobile device represents a conservative indicator of the monthly payment necessary for an individual to knowingly surrender the choice to keep their app activity private and allow Google to track all app activity data, regardless of that individual's WAA or sWAA settings."[256] He claims that this $3 payment, applied "on a one-time basis to the

[253] *See* **Exhibits 7A–7C**.
[254] To reiterate, I do not agree with or endorse Mr. Lasinski's damages methodology, and these recalculations should not indicate otherwise.
[255] Lasinski Report, ¶ 130.
[256] Lasinski Report, ¶ 131.

number of Class Member Devices," is the "most probative indicator" of class-wide "actual" damages.[257]

116. In this section, I show that Mr. Lasinski's methodology fails to calculate class-wide "actual" damages because it does not represent an economically relevant measure of any purported harm from the alleged wrongful conduct. Even if Mr. Lasinski's methodology was a conceptually valid measure of "actual" damages, it does not provide an adequate measure of the alleged harm suffered by putative class members due to the alleged wrongful conduct because it fails to consider the value of data in other data-sharing transactions in which the putative class members may have engaged. Moreover, Mr. Lasinski's "actual" damages methodology fails to appropriately measure class-wide damages in this matter because it includes many unharmed putative class members whose traffic resulted in no conversion events and/or no ad interactions, thereby resulting in no allegedly inappropriate data collection.

117. Even ignoring the prior issues *arguendo*, Mr. Lasinski's estimation of the amount of "actual" damages is also unreliable and speculative because: (1) it fails to measure actual economic harm alleged by Plaintiffs; (2) it fails to consider the value of data in other data sharing transactions in which the putative class members may have engaged; (3) if fails to exclude users who did not see or interact with an ad while having sWAA off; (4) it fails to account for differences between the data at issue in this matter and the data and other activities for which Screenwise participants are compensated, even under the assumption that the Plaintiffs suffered economic harm; (5) it fails to account for differences in putative class members' valuation of their personal data and online privacy; (6) it makes an erroneous and oversimplifying assumption about the number of users who switched the options for sWAA; (7) it relies on other irrelevant

[257] Lasinski Report, ¶ 131.

examples of users' willingness to pay to prevent data collection and research organizations' payments for data collection that do not measure the value of the data at issue in this matter; (8) it lacks any economic rationale for estimating the size of the proposed class as the number of purported "Class Member Devices;" and (9) it provides an unreliable and overstated number of "Class Member Devices" because it ignores changes to iOS policies and accounts with minimal or no activity.

A. Mr. Lasinski's "Actual" Damages Methodology Fails to Measure Actual Harm

118. I understand from counsel that "actual" damages for invasion of privacy presume, and compensate for, actual harm arising from the alleged wrongful conduct, *e.g.*, emotional distress. Applied to this matter, I understand Plaintiffs' allegations could be associated with emotional distress from alleged invasion of privacy.

119. In my review of the Lasinski Report, I have seen no evidence or indication that Mr. Lasinski's analysis attempts to measure or quantify actual harm experienced by any of the putative class members in the form of emotional distress. In fact, the testimony of named Plaintiffs corroborates that there was no such harm. If Plaintiffs had been harmed, one would expect that they would change their behavior and interactions with mobile apps using GA4F as a result of learning about the alleged wrongful conduct. However, as I discuss in **Section VII**, my review of the named Plaintiffs' testimony shows that these Plaintiffs did not alter their behavior in terms of their interactions with their respective mobile devices and mobile apps that may have used GA4F. For example, Mr. Cataldo could not identify a single behavioral change that he implemented as a result of this understanding;[258] Mr. Santiago continued to use the same apps in

[258] Cataldo Deposition, pp. 42:19–43:25.

his smartphone after learning about the alleged wrongful conduct;[259] Mr. Rodriguez chose to create another Gmail account instead of using a different provider because "it's easier to do a Gmail"[260] and he did not change his behaviors interacting with apps—nor did he advise his son to do so—other than turning WAA off;[261] and Ms. Harvey continued to use and create new Gmail accounts[262] and she did not remember deleting any apps, researching whether any apps used GA4F, or using any apps differently as a result of learning about the alleged wrongful conduct.[263]

120. Moreover, from an economic perspective, sWAA-off conversion measurement data are merely aggregate counts of certain app activity that Google provides to a third-party app developer. Further, sWAA-off GA4F app measurement data do not directly generate revenue for Google.[264] Even if Google had earned profit directly from sWAA-off conversion measurement data (which I understand it did not), Mr. Lasinski has not measured the value of emotional distress or the value of the data that were allegedly stolen.

B. Mr. Lasinski Fails to Consider the Value of Data in Other Data Sharing Transactions in Which the Putative Class Members May Have Engaged

121. As a conceptual matter, economic damages measure "the difference between the plaintiff's economic position if the harmful event had not occurred and the plaintiff's actual economic position."[265] Mr. Lasinski offers no precise characterization of putative class members'

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259 Santiago Deposition, pp. 162:11–20, 176:15–178:12, 180:1–11.
260 Rodriguez Deposition, pp. 311:8–313:9.
261 Rodriguez Deposition, pp. 327:2–15, 329:11–330:6.
262 Harvey Deposition, pp. 118:23–119:12.
263 Harvey Deposition, pp. 244:16–245:1; 248:13–19.
264 Interrogatory Response Set Six, Supplemental Response to Interrogatory No. 17, p. 14. "Google Analytics for Firebase (GA4F) app measurement data does not directly generate revenue for Google."
265 Allen, Mark A., Robert E. Hall, and Victoria A. Lazear, "Reference Guide on Estimation of Economic Damages," *Reference Manual on Scientific Evidence*, Third Edition, 2011, pp. 425–502.

economic position absent the alleged wrongful conduct. When referring to the basis for Plaintiffs' claim for "actual" damages, he merely states that he understands from Plaintiffs' counsel that this type of monetary relief is available to Plaintiffs.[266]

122. Based on Mr. Lasinski's calculation of "actual" damages, his implied characterization of the but-for world, *i.e.*, putative class members' position absent the alleged wrongful conduct, appears to be that the data at issue would have never been collected by Google and used for conversion measurement or providing analytics services.

123. However, I understand that, in many situations, there are already other entities collecting the same or similar information as the data at issue in this matter. For example, Mr. Ganem testified that third parties also provide similar services,[267] and Google offers instructions on how to set up conversion measurement and analytics measurement using many other providers such as AppsFlyer, Adjust, Singular, Kochava, and Branch.[268] An internal Google document dated as of June 2020 states, "80% of app conversions are tracked using non-Google SDKs."[269] I am not aware that any of these third parties provide any compensation or consideration to users in such transactions or data collection. Mr. Lasinski fails to consider the possibility that, in a but-for world in which Google does not provide conversion measurement or analytics measurement services using the data at issue in this matter, another party would provide similar services to app developers and publishers without generating any compensation or disbursement to users. As a result, putative class members' financial position would be unchanged in the but-for world, and actual economic damages would be zero.

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266 Lasinski Report, ¶ 69.
267 *See* Ganem Deposition, pp. 27:23–28:4.
268 *See* "Set up conversions from Firebase or App Attribution Partners for App campaigns for engagement," Google Ads Help, available at https://support.google.com/google-ads/answer/9260620.
269 GOOG-RDGZ-00056514–531 at 516.

124. Similarly, in the but-for world, it is reasonable to expect that app developers would still be willing to pay for the services offered by Google through Firebase and GA4F and that a different entity than Google would supply such services and collect similar data on putative class members' activity to provide app developers and advertisers with similar conversion measurement and bookkeeping functions. In fact, Firebase was originally not part of Google, but an independent company that Google acquired in 2014.[270]

125. Therefore, Mr. Lasinski's but-for world where putative class members' data about their online activity are not collected is not reliable for the purposes of quantifying "actual" damages and would overstate any such damages.

C. Mr. Lasinski's "Actual" Damages Fail to Exclude Users Who Did Not See or Interact with an Ad While Having sWAA Off

126. Mr. Lasinski's methodology to calculate "actual" damages assumes that all of the almost 91 million putative class members he estimates suffered damages as a result of the alleged wrongful conduct. This conclusion is incorrect and misleading.

127. I understand that Google's receipt of the data at issue results from either the serving of an ad or certain events or actions taken by putative class members on their mobile devices such as interacting with an ad served by Google, thereby triggering a conversion measurement event.[271] It is likely, however, that certain putative class members did not see or

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[270] Tamplin, James, "Firebase is Joining Google!," Firebase, October 21, 2014, available at https://firebase.blog/posts/2014/10/firebase-is-joining-google.

[271] *See* Interrogatory Response Set One, Fourth Supplemental Response to Interrogatory No. 1, p. 19 ("Event-logging occurs at the same time as the interactions that trigger the event. For example, when a user clicks a specific button that the app developer has chosen to track using GA for Firebase, that button click is logged as it occurs. It is typically not uploaded to Google servers until later"). *See also* "Events," Google Tags, available at https://developers.google.com/tag-platform/devguides/events.

interact with an ad while having sWAA turned off and therefore did not generate the data at issue, which would imply "actual" damages could not have occurred.

128. Mr. Lasinski's methodology fails to identify or exclude such users in any way. His calculations assume that any putative class member who ever had sWAA off on any mobile device during the proposed class period suffered "actual" damages in the same measure for each of their devices. I understand that certain accounts that may be logged in are used very rarely such that they may be "Active" or "signed-in" accounts in Google's records but have little to no ad engagement or traffic at all, thereby resulting in little to no conversion activity.[272] There are approximately 1 billion U.S.-based Google accounts,[273] and Mr. Lasinski's estimate of the number of internet users in the U.S. is 273 million.[274] This means there are approximately four U.S.-based Google accounts per internet user, and likely more than four U.S.-based Google accounts per internet user who has at least one Google account (since many users have none). However, Mr. Keegan's survey estimates 1.77 Gmail accounts per user.[275] This suggests the existence of a much larger number of accounts than those that are actually used by Google account holders or putative class members.

129. As a result, Mr. Lasinski's methodology to calculate "actual" damages is unreliable because it includes numerous unharmed putative class members with no relevant activity and data collection.

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[272] For example, named Plaintiff Mr. Rodriguez testified that he has twelve Google accounts, some of which he "[doesn't] really use," some of which he uses only as "spoof" accounts to create accounts on other websites, some that he opened for the purposes of creating YouTube videos, and some that he created for his sons. *See* Rodriguez Deposition, pp. 59:3–75:5, 132:7–9.

[273] GOOG-RDGZ-00187010, tab "sWAA" (showing 987 million U.S. accounts active at any time between July 27, 2016 and July 27, 2020).

[274] Lasinski Report, ¶ 168.

[275] Lasinski Report, ¶ 172.

D. Mr. Lasinski Presents No Economic Basis for His "Actual" Damages Estimate of $3 Per Class Member Device

130. Even assuming Mr. Lasinski's methodology could measure "actual" damages, and ignoring his inclusion of unharmed putative class members, Mr. Lasinski fails to provide an economic basis for why his $3 per class member device measures on a class-wide basis the quantum of harm that putative class members may have suffered as a result of the alleged wrongful conduct.

131. Mr. Lasinski fails to provide any adequate foundation or economic analysis to support his claim that each putative class member suffered $3 of "actual" damages per device. As a result, his methodology to quantify class-wide damages is unreliable.

132. Mr. Lasinski argues that "the baseline payment to Screenwise Panel participants of $3 per month for using a Screenwise meter app on a single mobile device [including both smartphones and tablets] represents a conservative indicator of the monthly payment necessary for an individual to knowingly surrender the choice to keep app activity private and allow Google to track app activity data, regardless of that individual's WAA or sWAA settings."[276] He adds that "[w]hile the Screenwise compensation structure applies this $3 payment per device per month, it is my opinion that actual damages through December 2022 can be conservatively measured by applying this $3 payment on a one-time basis to the number of Class Member Devices."[277]

133. However, Mr. Lasinski does not explain why he chose this amount. For example, his only attempt at connecting the amount of the Screenwise payment to the alleged harm in this

[276] Lasinski Report, ¶ 131.
[277] Lasinski Report, ¶ 131.

matter is his claim that this $3 payment represents a payment necessary for an individual to surrender the privacy of their app activity to Google regardless of their WAA settings. However, this is at best a tenuous similarity between the alleged wrongful conduct and the relationship between Screenwise and its panelists. As I explain below, tracking app activity is only a small fraction of the activity of Screenwise panelists, and Mr. Lasinski makes no attempt to explain why these two activities are comparable or why the value of the data collected from Screenwise panelists is comparable to the value of the data at issue in this matter.

134. Furthermore, Mr. Lasinski provides no explanation or rationale to apply the monthly $3 payment from Screenwise to calculate class-wide damages in this matter.

135. Similarly, Mr. Lasinski provides a description of other payments to internet users related to the tracking of online activity, namely AT&T's GigaPower campaign and payments from two other companies—Nielsen and SavvyConnect—to participants in their respective panels or applications.[278] However, he provides no comparison to the data at issue or to Plaintiffs' allegations that would suggest these amounts may be an adequate measure of actual harm in this matter. As I explain below, none of these payments are an appropriate measure of any purported actual harm in this matter.

1. Mr. Lasinski fails to distinguish the data at issue from the data collected by Screenwise and other requirements imposed on Screenwise panelists

136. The payment that Screenwise panelists receive as compensation for their participation most likely overstates the value of app activity data privacy for an individual. Even if the $3 per month Screenwise payment were an appropriate starting point for "actual" damages,

[278] Lasinski Report, ¶¶ 144, 148, 150.

Mr. Lasinski would need to reduce this value to adjust for several factors that set the data associated with the alleged wrongful conduct in this matter apart from data collection and other requirements associated with participation in Screenwise—factors that reasonably increase the value and cost of Screenwise data collection. These include (i) Screenwise collecting much more comprehensive data on its panelists than the data at issue in this case, (ii) Google's ability to link Screenwise data to other sources and types of data, and (iii) behavioral requirements imposed by Screenwise on its panelists.

137. First, Screenwise panelists agree to send to Google a much more comprehensive set of data about their activity on a mobile device than just the data at issue in this matter (*i.e.*, mobile web and app activity data).[279] For example, the data collected by Screenwise include all browsing activity, URL data, IP addresses of visited websites, the length of time spent in each website; information about the use of telephone, email, and text messages; and cookies or other identifiers from a browser.[280] Similarly, Screenwise collects other types of data about the user's device such as device identifiers, location data, data from the device's motion sensors, data and storage use, battery status, and information about Wi-Fi networks that the device is connected to.[281] These data are much more comprehensive that the at-issue data in this matter, which Mr. Lasinski fails to consider.

138. Second, Google can link the data collected by Screenwise to other sources and types of data that are not available from putative class members through the data associated with the alleged wrongful conduct in this matter. This includes, for example, audio data from the

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279 Mr. Lasinski also acknowledges that participants in the Screenwise Panel "knowingly allow Google to *track all online activity* on the device." Lasinski Report, ¶ 151, emphasis added.

280 "Google Panel Privacy Policy," Ipsos Screenwise Panel, available at https://screenwisepanel.com/google-panel-privacy-policy.

281 "Google Panel Privacy Policy," Ipsos Screenwise Panel, available at https://screenwisepanel.com/google-panel-privacy-policy.

Screenwise TV meter,[282] information about other devices connected to the same network as the user's device, and information about other accounts used on the same device.[283] This also includes detailed demographic and identifying data collected upon registration to Screenwise and from other surveys that panelists may fill out during their participation. These survey data may include full name; home and work addresses; phone numbers; email addresses; and demographic information about the panelist and other members of their household, such as age, gender, race, ethnicity, languages spoken, education, marital status, personal income, household income, number of children, and the total number of people living in the household.[284] While panelists may be compensated separately for some of these data, such as for the use of the TV meter, the ability to link these data across a single user's devices increases the total value of those data.[285]

139. Third, Screenwise panelists receive compensation not only for sharing their web and app activity data. They also receive compensation for spending their time and effort on certain activities such as registering for the panel, filling out surveys, and installing and keeping the meter apps on their mobile device. For example, the Screenwise policies specify that participants may be asked to log into their Google accounts regularly and confirm that the

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[282] "Google Panel Privacy Policy," Ipsos Screenwise Panel, available at https://screenwisepanel.com/google-panel-privacy-policy ("The TV Meter has a microphone that, when enabled, captures all nearby audio so that Google can determine what programs are being watched based on the audio coming from the TV. We will seek your permission before collecting audio data. You are responsible for informing non-panelists, including visitors, of this metering.").

[283] "Google Panel Privacy Policy," Ipsos Screenwise Panel, available at https://screenwisepanel.com/google-panel-privacy-policy.

[284] "Google Panel Privacy Policy," Ipsos Screenwise Panel, available at https://screenwisepanel.com/google-panel-privacy-policy.

[285] For example, Mr. Hochman, explains that data linked to Google's GAIA ID are more valuable to Google because GAIA ID allows Google to "track users across apps and websites, on any device" and thus "maintain a more complete view of the user." (Hochman Report, ¶ 54.) However, I understand that the sWAA-off data at issue are not linked to GAIA ID, unlike the Screenwise data. *See* Interrogatory Response Set One, Fourth Supplemental Response to Interrogatory No. 1, p. 25 (which explains that "[i]f any aspect of the consent check fails, the user data is not stored in GAIA space, and the DSIS/IDFA is deleted" and "[f]rom the signed-in GAIA copy of data, Google removes all pseudonymous identifiers. From the signed-out pseudonymous log, Google removes all signed-in identifiers").

information associated with their profile is up to date and accurate.[286] Similarly, Screenwise imposes certain restrictions on the online activity of panelists. For example, panelists are not allowed to use ad-blockers or any kind of "do not track" features, turn location-reporting services off, or otherwise opt out of any kind of online advertising.[287]

140. In summary, even if the $3 payment per mobile device from Screenwise were an appropriate starting point for "actual" damages in this matter, that figure would overestimate any measure of actual harm due to the alleged wrongful conduct because it ignores that the $3 Screenwise payment compensates users for a multiplicity of data, activities, and restrictions that exceed the breadth of the data at issue in this matter.

2. Mr. Lasinski ignores that not all putative class members are harmed equally because not all putative class members value their data equally

141. Mr. Lasinski's methodology assigns a value of $3 of "actual" damages to each "Class Member Device." Mr. Lasinski does not make clear whether he believes that every putative class member was harmed by the same amount or that this amount is a reasonable estimate of the average amount of "actual" damages suffered per putative class member. Regardless, neither of these interpretations would be consistent with economic principles and evidence.

142. I understand that Dr. Ghose, another expert for Google in this matter, opines that users' preferences about data privacy vary not only across individuals but even over time for a given individual, with certain users being "unconcerned" about privacy, others being

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286 "Google Panel Terms & Conditions," Ipsos Screenwise Panel, available at https://screenwisepanel.com/google-panel-terms-condition.

287 "Google Panel Terms & Conditions," Ipsos Screenwise Panel, available at https://screenwisepanel.com/google-panel-terms-condition.

"fundamentalists" of privacy, and others being "pragmatists" who evaluate the costs and benefits of data collection.[288]

143. Therefore, the alleged harm associated with the collection of one unit of the data at issue is likely to vary across putative class members. Moreover, it is reasonable to expect that the amount of online activity will vary across putative class members and therefore so will the amount of data at issue that Google received for each of them, *e.g.,* conversion measurement events generated by GA4F.

144. Lastly, as I discuss above, users receive benefits or utility from a better ad-supported app experience as a result of Google's activity. These benefits are also likely to vary across individuals or putative class members. It is even possible that some users may have not suffered a net economic harm because they value the benefits from Google's receipt of the data at issue more than they value the alleged loss of their private data.

145. Therefore, "actual" damages as contemplated by Mr. Lasinski's methodology would differ from one putative class member to another. However, Mr. Lasinski fails to account for the variability in the amount of data collected from different putative class members and also the variability in the economic benefit or harm that putative class members may have experienced by virtue of sharing their data. Therefore, Mr. Lasinski fails to consider this variation or to provide a methodology that estimates "actual" damages according to the harm suffered by different putative class members.

146. The distribution of online users' valuations of their privacy and data can likely be described by an upward-sloping supply curve found in basic economics textbooks, where users

[288] *See* Expert Rebuttal Report of Anindya Ghose, Ph.D., May 31, 2023, Section II.A..

with a lower valuation of their data would demand a lower payment in exchange for sharing the data, but users with a higher valuation of their data would demand a higher price, such that the higher a single market price is, the more users—or "sellers"— would be willing to participate.[289]

147. Therefore, to accomplish the goal of selecting a panel that is representative of the online population at large, Screenwise must offer a high enough compensation to attract a large enough and varied enough pool of candidates to represent the overall online population. Any lower compensation may attract only a selected sample of panelists with a lower valuation on privacy. This means not only that the $3 payment would overstate the average amount required to make online users agree to participate in the panel, but also that measuring different putative class members' valuation of the data requires individualized inquiry.

3. Mr. Lasinski makes an erroneous and oversimplifying assumption for putative class members who toggled between on/off options for sWAA

148. Mr. Lasinski's calculation of "actual" damages assumes that no meaningful fraction of putative class members switch their sWAA on/off status, *i.e.*, that the proportion of users with sWAA off is constant throughout the proposed class period.[290] As a result, Mr. Lasinski estimates that "actual" damages are the same for every putative class member who had sWAA off at any time during the proposed class period. However, evidence suggests that a substantial portion of users switched their sWAA on/off status at least once during the proposed class period.

[289] Hubbard, Glenn R., and Anthony Patrick O'Brien, "Microeconomics," Seventh Edition, Pearson, 2019, pp. 82–86.

[290] Lasinski Report, ¶¶ 47–49, 155.

149. Figure 7 in the Lasinski Report shows that 42.5 percent of accounts had sWAA off at some point between July 27, 2016, and July 27, 2020. The figure also shows that 80.5 percent of accounts had sWAA on at some point in the same period, which implies that only 19.5 percent of accounts had sWAA off the entire time.[291] It follows that 23 percent—nearly a quarter—of accounts switched sWAA on/off status at least once during the period.[292] Though these statistics apply to a subset of the proposed class period, these figures strongly suggest that a considerable fraction of accounts switched sWAA on/off status during the proposed class period. If consumers choose their sWAA status in each month optimally, or nearly optimally, then these consumers are not harmed during months where sWAA is on. In these months, consumers have chosen to keep sWAA on because the benefits of doing so—for example, an improved user experience—exceed the costs. Treating such consumers as harmed during these months (as Mr. Lasinski does) ignores their own observed decisions and preferences. For example, one potential approach would be to prorate the $3 per-device payment by the number of months during which each user opted into sWAA-off status.

150. Though Mr. Lasinski cites Google documents that purportedly show a user's WAA setting is "rarely changed,"[293] the evidence he cites fails to support this assumption. For example, Mr. Lasinski cites an email in which a Google employee indicates that 99.5 percent of accounts active in the last 28 days did not change their WAA status.[294] But, this estimate is based on less than a month of data and is not necessarily representative of switching behavior over the full 90-month proposed class period. Moreover, if 0.5 percent of active accounts were to switch their WAA status every month, up to 45 percent of accounts could switch their status over the

[291] 795,323,800 / 987,440,442 = 80.5%.
[292] 42.5% sWAA-off at least some of the time *minus* 19.5% sWAA off all the time.
[293] Lasinski Report, ¶ 47.
[294] Lasinski Report, ¶ 47.

90-month proposed class period.[295] The actual number of accounts that switched their status at least once during the proposed class period likely falls somewhere in between 0.5 and 45 percent, but it is not necessarily the case that users' WAA settings "rarely changed," as Mr. Lasinski claims.

151. As a result of this omission, Mr. Lasinski's incorrect assessment of the likelihood that a user switches their sWAA on/off status causes him to fail to apportion "actual" damages to a reasonable estimate of how often a user had sWAA on, thus overstating damages.

E. Mr. Lasinski's Examples of Users' Willingness to Pay to Prevent Data Collection and Research Organizations' Payments for Data Collection Do Not Measure the Value of the Data at Issue

152. In addition to his analysis of the $3 payment from Screenwise, Mr. Lasinski considers two other purported indicators of market payments related to tracking online activity: the AT&T Internet Preferences program, and payments from two companies—Nielsen and SavvyConnect—to participants in surveys or market research activities.[296] Neither of these alternative indicators is appropriate in this matter. Mr. Lasinski also does not provide any further analysis as to why these programs and their related payments might provide any reliable measure of class-wide damages. He also offers no basis to choose one over the other, nor any basis for why he chose the Screenwise payment over them. In any case, none of these examples provides a reliable indicator of the amount of any "actual" damages in this case. As with the Screenwise payment, these alternative payments also involve a much broader set of data than those at issue

[295] 0.5% new switching per month *times* 90 months = up to 45% switching over the 90-month period. This is meant only as an illustration and assumes that no account switches more than once over the period and the number of active Google accounts is fixed across time. Though this is merely an illustration, it is notable that the figure 23 percent, which I discuss above, falls squarely in the middle between 0.5 percent and 45 percent.

[296] Lasinski Report, ¶¶ 132, 143–150.

in this case, collect these data for different purposes, account for ancillary activities and not merely the passive collection of data, and fail to measure the value of emotional distress as I discuss in **Section X.A** above.

153. First, the Internet Preferences program essentially amounts to a discount that AT&T offered to its broadband internet customers (in a few select areas) in exchange for tracking their online activity to deliver tailored advertising.[297] Customers could opt into a more expensive tier of AT&T's internet service that would exclude them from this data collection and subsequent advertising.[298] However, as an internet service provider, AT&T has access to a unique set of demographic information from users as well as data across all of their devices and activity, regardless of whether or not they use a Google account.[299]

154. Similarly, neither Nielsen nor SavvyConnect made payments in exchange for data similar to those at issue in this case. These companies also collect detailed personal and demographic information about participants such as name, gender, and other demographic data.[300] Moreover, these programs require participants to fill out information in their accounts,

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297 Auerbach, David, "Privacy Is Becoming a Premium Service," March 31, 2015, Slate, available at https://slate.com/technology/2015/03/at-t-gigapower-the-company-wants-you-to-pay-it-not-to-sell-your-data html. *See also* Brodkin, Jon, "AT&T's Plan to Watch Your Web Browsing—and What You Can Do About It?," ArsTechnica, March 27, 2015, available at https://arstechnica.com/information-technology/2015/03/atts-plan-to-watch-your-web-browsing-and-what-you-can-do-about-it/.

298 Brodkin, Jon, "AT&T's Plan to Watch Your Web Browsing—and What You Can Do About It?," ArsTechnica, March 27, 2015, available at https://arstechnica.com/information-technology/2015/03/atts-plan-to-watch-your-web-browsing-and-what-you-can-do-about-it/.

299 Auerbach, David, "Privacy Is Becoming a Premium Service," March 31, 2015, Slate, available at https://slate.com/technology/2015/03/at-t-gigapower-the-company-wants-you-to-pay-it-not-to-sell-your-data html. *See also* Hall, Gina, "AT&T to halt gathering customers' web-browsing data, stop charging for an opt-out," October 3, 2016, The Business Journals, available at https://www.bizjournals.com/bizjournals/news/2016/10/03/at-t-to-halt-gathering-customers-web-browsing-data html. *See also* Brodkin, Jon, "AT&T's Plan to Watch Your Web Browsing—and What You Can Do About It?," ArsTechnica, March 27, 2015, available at https://arstechnica.com/information-technology/2015/03/atts-plan-to-watch-your-web-browsing-and-what-you-can-do-about-it/.

300 The Nielsen Computer and Mobile Panel to which Mr. Lasinski cites states: "Download our safe and secure Nielsen app or computer software on your qualified devices. … Answer our registration questions to tell us more about you, your household, and the devices you use." *See* "Nielsen Computer and Mobile Panel," Nielsen, available at https://computermobilepanel.nielsen.com/ui/US/en/sdp/landing.

install tracking apps on their devices,[301] and responding to surveys to provide additional information. For example, the Nielsen mobile panel collects "information relating to your racial or ethnic origin, political opinions, religious or other similar beliefs, philosophical beliefs, health or medical conditions, or sexual orientation."[302] Therefore, payments in exchange for these data and other activities do not represent a reliable or informative measure of "actual" damages in this matter. Reliance on these surveys renders Mr. Lasinski's damages methodology flawed and unreliable (even aside from its various other flaws).

F. Mr. Lasinski Fails to Provide Sufficient Foundation or Economic Analysis for His Estimate of the Size of the Proposed Class

155. Mr. Lasinski arrives at his estimate of "actual" damages by multiplying the $3 payment from Screenwise by his estimate of the size of the proposed class.[303] However, his estimate of the size of the proposed class is unreliable and overstated.

1. There is no economic rationale for estimating the size of the proposed class as Mr. Lasinski's number of Class Member Devices

156. Mr. Lasinski estimates the size of the proposed class as what he calls the number of "Class Member Devices, where a single Class Member Device represents a mobile device (smartphone or tablet) used with WAA/sWAA off at least once during the [proposed] Class Period through December 2022."[304]

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301 The Nielsen Computer and Mobile Panel to which Mr. Lasinski cites states: "Download our safe and secure Nielsen app or computer software on your qualified devices. … Answer our registration questions to tell us more about you, your household, and the devices you use." *See* "Nielsen Computer and Mobile Panel," Nielsen, available at https://computermobilepanel.nielsen.com/ui/US/en/sdp/landing.

302 *See* "Nielsen U.S. Panel Privacy Notice Summary," Nielsen, available at https://computermobilepanel.nielsen.com/ui/US/en/privacypolicyen.html. *See also* "How it Works," Super Savvy, available at https://www.surveysavvy.com/how_it_works.

303 Lasinski Report, ¶ 161.

304 Lasinski Report, ¶ 152.

157. There is no economic rationale to use the number of devices as the size of the putative class. While it is true that the Screenwise panel provides compensation to participants for each device they connect to the panel, this is consistent with the goal of incentivizing panelists to connect all of their devices to Screenwise in order to obtain a comprehensive picture of panelists' online activity. But, this is irrelevant as a measure of the size of the class or the amount of "actual" damages in this matter.

158. Mr. Lasinski defines "actual" damages "as a function of the payments necessary to incentivize an individual to knowingly surrender the choice to keep activity on mobile apps private and allow an organization to track app activity data."[305] However, he does not provide any explanation for why class-wide damages should increase proportionally with the number of devices that putative class members use.

159. There is no reasonable economic rationale for class-wide damages to increase proportionally with what Mr. Lasinski calls the numbers of "Class Member Devices." For example, consider a scenario in which each putative class member owns exactly one Class Member Device: their primary smartphone running Android. On the other hand, if every putative class member were to split their online activity between their primary smartphone and a tablet purely for convenience (but made no other changes in their online activity), Mr. Lasinski's estimated "actual" damages would double. This is incorrect because putative class members would not suffer any additional harm in the latter scenario.

160. In fact, publicly available studies show that, while device usage may increase with ownership of additional devices, the increase in usage is less than proportional to the additional

[305] Lasinski Report, ¶ 130.

number of devices. For example, a study by market research companies show that the number of activities performed on a smartphone by users in the U.S. does not increase with the ownership of a second device, and it increases less than twofold when the user owns a fourth device.[306] Another study shows that time spent on one device can simply be a substitute for time spent on another device and users are shifting some of their time previously spent on tablets to time spent on smartphones.[307]

161. Similarly, named Plaintiffs' depositions support the argument that online activity does not increase proportionally with device ownership and that users may seldom use secondary devices. For example, Ms. Harvey testified that she "had some tablets" that she was not sure she used at all, and that she owns a tablet that she used "for probably 10 minutes."[308] Similarly, Mr. Cataldo testified that, besides his Pixel smartphone and a Blackberry, he "may have" a tablet at work that he "[hasn't] used in years."[309] But, Mr. Lasinski's damages methodology would include damages for each of these barely-used devices. Therefore, Mr. Lasinski's methodology cannot provide a reliable estimate of class-wide "actual" damages.

2. Mr. Lasinski's methodology cannot provide a reliable estimate of the number of Class Member Devices

162. Even setting aside its conceptual flaws, Mr. Lasinski's quantification of the number of "Class Member Devices" is overstated and would therefore inflate "actual" damages.

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306 *See* "Multiple device ownership means more smartphone usage," Kantar, September 23, 2021, available at https://cdne kantar.com/north-america/inspiration/technology/multiple-device-ownership-means-more-smartphone-usage.

307 *See* "US Time Spent with Mobile 2019," eMarketer, May 30, 2019, available at https://www.insiderintelligence.com/content/us-time-spent-with-mobile-2019.

308 Harvey Deposition, pp. 138:6–140:10.

309 Cataldo Deposition, p. 69:2–9.

163. First, as I discuss in **Section VI** above, Mr. Lasinski fails to exclude users with devices that did not allow Google to know sWAA-off status because of changes in Apple's policies when iOS 14 launched in September 2020. While Google may have received the data at issue for some of these users prior to the iOS 14 update, it is reasonable to expect that Google did not receive such data for a meaningful number of new smartphone users over that period, as smartphone penetration rates were still increasing in the U.S. through 2021.[310]

164. Second, Mr. Lasinski adjusts his estimate of the number of putative class members by the 84.1 percent of smartphone users with a Gmail account based on Mr. Keegan's survey.[311] However, neither Mr. Keegan nor Mr. Lasinski considers whether any of these users actually used their respective Gmail accounts actively during the proposed class period. Google recently announced that it will start deleting inactive accounts, which suggests that some users in fact do not actively use their Google accounts.[312] However, Mr. Lasinski's calculation of "actual" damages increases by $3 for each of these users because they are included in his calculation of the number of Class Member Devices. To the extent that some of these users have not actively used their Google accounts during the proposed class period, Mr. Lasinski's methodology would overstate "actual" damages.

XI. MR. LASINSKI'S METHODOLOGY FOR APPORTIONING DAMAGES IS UNRELIABLE

165. Mr. Lasinski proposes to apportion damages across the two classes based on Android and Apple operating systems, and his estimation of the proportion of users signed in on

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310 *See* "Percentage of U.S. adults who own a smartphone from 2011 to 2021," Statista, April 2021, available at https://www.statista.com/statistics/219865/percentage-of-us-adults-who-own-a-smartphone/.

311 Lasinski Report, ¶¶ 167–168.

312 Kricheli, Ruth, "Updating our inactive account policies," Google, May 16, 2023, available at https://blog.google/technology/safety-security/updating-our-inactive-account-policies/.

each of these platforms.[313] He proposes two methods to apportion damages among members of each class: (1) based on the number of "sWAA-Off User Months;" or (2) based on the number of putative class members. He provides no rationale for offering two distinct apportionment methodologies, nor does he provide guidance as to why to choose one over the other. He also provides no rationale for why either of these methods would be appropriate for allocating damages in this matter. In other words, his "methodology" to allocate damages is limited to calculating two numbers and making the trivial statement that the total amount of damages can be divided by those numbers.

166. Neither of these methodologies would adequately apportion damages among putative class members because: (1) they are inconsistent with Mr. Lasinski's proposed methodology to calculate "actual" damages—which is based on "Class Member Devices;" (2) they ignore heterogeneity among different putative class members with respect to the volume and quality of data received by Google; and (3) it provides an incomplete and unreliable methodology to estimate and attribute Mr. Lasinski's estimated "sWAA-Off User Months" to putative class members.

A. Mr. Lasinski's Proposed Methodology to Apportion Damages Among Putative Class Members Is Inconsistent with His Own Methodology to Calculate Damages

167. Mr. Lasinski proposes to apportion damages based on either the number of "sWAA-Off User Months" or the number of putative class members. However, he calculates putative-class-wide "actual" damages by applying a $3 payment to the number of "Class Member Devices," regardless of the number of months during which an account is in sWAA-off

[313] Lasinski Report, ¶ 164.

status. This incongruence between Mr. Lasinski's methodologies to calculate and allocate damages reflects not only the general lack of support for his methodologies but also creates scenarios where putative class members could be vastly over- or undercompensated relative to their notional contribution to Mr. Lasinski's calculation of damages. For example, a putative class member who owned a single device through the entire proposed class period and had sWAA turned off the entire time would contribute $3 to Mr. Lasinski's calculation of "actual" damages, while another putative class member who acquired a smartphone and a tablet for the first time in December 2022 and used those devices occasionally with sWAA off, would contribute $6 to Mr. Lasinski's calculation of "actual" damages. However, these two putative class members would be compensated equally under Mr. Lasinski's "class member" method. But, the first putative class member, who contributed half as much to Mr. Lasinski's calculation of "actual" damages, would receive a compensation several times higher under Mr. Lasinski's "sWAA-Off User Months" method.

B. Mr. Lasinski's Methodology to Apportion Damages Ignores Heterogeneity Among Different Putative Class Members with Respect to the Volume and Quality of Data Received by Google

168. Both of Mr. Lasinski's methods of allocating damages fail to account for differences in the volume and quality of the data at issue that Google may have received and thus fail to compensate putative class members in proportion to either the "actual" damages they may have suffered or in proportion to their contribution to Google's profit allegedly subject to disgorgement. While Mr. Lasinski's "sWAA-Off User Months" methodology would seemingly increase a putative class member's allocation of damages based on a measure that may correlate with how long they used their mobile device(s) with sWAA off, this is only one of the many dimensions of this heterogeneity. Google likely would have received substantially more of the

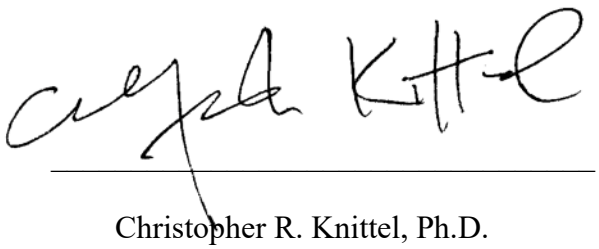
data at issue for some putative class members than others based on the type and amount of their activity while having sWAA off, *e.g.*, based on whether and how they may have interacted with ads that generated conversion measurement events. Neither of Mr. Lasinski's allocation methods consider users' levels of activity.

C. Mr. Lasinski's "sWAA-Off User Months" Methodology Is Incomplete and Unreliable

169. Mr. Lasinski claims that the total amount of either disgorgement of profit damages or "actual" damages "[could] be distributed to [putative] Class members in the claims administration process as a function of the number of sWAA-Off User Months deemed attributable to each [putative] Class member."[314]

170. However, Mr. Lasinski provides no methodology to attribute "sWAA-Off User Months" to each putative class member or even any insight of how he or a claims administrator would accomplish this. Without a methodology to attribute his estimate of over three billion "sWAA-Off User Months" to putative class members, Mr. Lasinski fails to provide any method to allocate a specific amount of damages to each putative class member. As such, Mr. Lasinski's methodology to allocate damages is incomplete and inapplicable as proposed.

May 31, 2023



Christopher R. Knittel, Ph.D.

[314] Lasinski Report, ¶ 174.

APPENDIX A
CURRICULUM VITAE

CHRISTOPHER ROLAND KNITTEL
Sloan School of Management
Massachusetts Institute of Technology
100 Main Street
Cambridge, MA 02142
Office: 617-324-0015
Fax: 617-258-6786
knittel@mit.edu
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CURRENT APPOINTMENTS:

2016-present, George P. Shultz Professor, Massachusetts Institute of Technology
2011-present, Professor of Applied Economics, Sloan School of Management, MIT
2022-present, Area Head for Economics, Finance, and Accounting, MIT Sloan
2012-present, Director, Center for Energy and Environmental Policy Research, MIT
2022-present, Deputy Director for Policy, MIT Energy Initiative
2013-present, Faculty Co-Director, The E2e Project, MIT, UCB, University of Chicago
2013-present, Associate Scholar, Harvard Environmental Economics Program
2007-present, Research Associate, National Bureau of Economic Research Groups: Environmental Economics and Energy, Industrial Organization, and Productivity
2007-present, Associate Editor, *The Journal of Energy Markets*
2013-present, Associate Editor, *The Journal of Transportation Economics and Policy*

PREVIOUS APPOINTMENTS:

2011-2016, William Barton Rogers Professor of Energy Economics, Sloan School of Management, Massachusetts Institute of Technology
2017-2022, Co-Director, Electric Power Systems Low Carbon Energy Center, MIT
2015-2018, Group Head, Applied Economics Group, Sloan School of Management
2014-2018, Co-Editor, *Journal of Public Economics*
2007-2013, Associate Editor, *American Economic Journal – Economic Policy*
2006-2012, Associate Editor, *The Journal of Industrial Economics*
2006-2011, Associate Professor of Economics, University of California, Davis
2003-2011, Visiting Research Fellow, University of California Energy Institute
2005-2011, Faculty Affiliate, Institute of Transportation Studies, UC Davis
2006-2011, Strategy and Policy Thread Leader for STEPS
2008-2010, Member, Economic and Allocation Advisory Committee for AB32's cap-and-trade program, State of California
2008-2011, Chancellor's Fellow, University of California, Davis
2002-2006, Assistant Professor of Economics, University of California, Davis
2004-2007, Faculty Research Fellow, National Bureau of Economic Research.
Groups: Environmental Economics and Energy, Industrial Organization, and Productivity

1999-2002, Assistant Professor of Finance and Economics, School of Management, Boston University

1996-1999, Research Assistant, University of California Energy Institute

1994-1996, Teaching Assistant, University of California, Davis

EDUCATION:

Ph.D., University of California, Berkeley, 1999 (Economics)

M.A., University of California, Davis, 1996 (Economics)

B.A., California State University, Stanislaus, *summa cum laude*, 1994 (Economics and Political Science)

PUBLICATIONS:

- Knittel, Christopher R., Konstantinos Metaxoglou, Anson Soderbery, and Andres Trindade. "Exporting Global Warming? Coal Trade and the Shale Gas Boom." ***The Canadian Journal of Economics***, 55(3), August 2022.
- Abito, Miguel, Christopher R. Knittel, Konstantinos Metaxoglou, and Andre Trindade. "The Role of Output Reallocation and Investment in Coordinating Externality Markets." ***The International Journal of Industrial Organization,*** 83, July 2022.
- Caminade, Juliette, Juan Carvajal, Christopher R. Knittel. "Am Economic Analysis of the Self-Preferencing Debate," ***Competition***, 32(2), Fall 2022. Winner of the 2023 *Concurrences* Antitrust Writing Award for best business article in economics.
- Adam, Kevin C., Juliette Caminade, Christopher R. Knittel. "The Intersection of Self-Preferencing and Pricing Practices in the Digital World," ***American Bar Association, Antitrust Law Section***, June 2022.
- Chen, Chia-Wen, Wei-Min Hu, Christopher R. Knittel. "Subsidizing Fuel Efficient Cars: Evidence from China's Automobile Industry." ***The American Economic Journal: Economic Policy***, 14(4), November 2021**.**
- Clinton, Bentley C., Christopher R. Knittel, and Konstantinos Metaxoglou, "Chapter 18: Electrifying transport: issues and opportunities." ***Handbook on Electricity Markets***, November 2021.
- Knittel, Christopher R., and Shinsuke Tanaka, "Fuel economy and the price of gasoline: Evidence from fueling-level micro data." ***Journal of Public Economics***, 202, October 2021.
- Knittel, Christopher R., and Samuel Stolper, "Machine Learning about Treatment Effect Heterogeneity: The Case of Household Energy Use." ***AEA Papers and Proceedings***, 111, May 2021.
- Archsmith, James, Kenneth Gillingham, Christopher R. Knittel, and David Rapson. "Attribute Substitution in Household Vehicle Portfolios." ***The RAND Journal of Economics***, 51(4), Winter 2020.
- Burlig, Fiona, Christopher R. Knittel, David Rapson, Mar Reguant, Catherine Wolfram. "Machine Learning from Schools about Energy Efficiency." ***Journal of the Association of Environmental and Resource Economists***, 7(6), November 2020.
- Ge, Yanbo, Christopher R. Knittel, Don MacKenzie, and Stephen Zoepf. "Racial Discrimination in Transportation Network Companies." ***Journal of Public Economics***, 190, October 2020.

- Gillingham, Kenneth, Christopher R. Knittel, Jing Li, Marten Ovaere, Mar Reguant. "The Short-Run and Long-Run Effects of Covid-19 on Energy and the Environment," ***Joule***, July 15, 2020 (Commentary).
- Burger, Scott P., Christopher R. Knittel, Ignacio J. Perez-Arriaga, Ian Schneider, and Frederik vom Scheidt. "The Efficiency and Distributional Effects of Alternative Residential Electricity Rate Designs." ***The Energy Journal***, 41(1), June 2020.
- Jacobsen, Mark, Christopher R. Knittel, James Sallee, and Arthur van Benthem. "The Use of Regression Statistics to Analyze Imperfect Pricing Policies." ***Journal of Political Economy***, 128(5), May 2020, pp. 1826-1876.
- Bento, A. M., Jacobsen, M. R., Knittel, C. R., and Van Benthem, A. A. "Estimating the Costs and Benefits of Fuel-Economy Standards," ***Environmental and Energy Policy and the Economy***, 1(1), January 2020, 129-157.
- Bartik, Alexander W., Janet Currie, Michael Greenstone, Christopher R. Knittel. "The Local Economic and Welfare Consequences of Hydraulic Fracturing." ***The American Economic Journal: Applied Economics***, 11(4), October 2019, pp 105-155.
- Hashmat Khan, Christopher R. Knittel, Konstantinos Metaxoglou, and Maya Papineau. "Carbon Emissions and Business Cycles" ***The Journal of Macroeconomics,*** 60(1) June 2019, pp 1-19.
- Knittel, Christopher R., Konstantinos Metaxoglou, and Andre Trindade. "Environmental Implications of Market Structure: Shale Gas and Electricity," ***International Journal of Industrial Organization,*** 63(2), March 2019, pp 511-550. **Winner of the IJIO Best Empirical Paper Award.**
- Davis, Lucas and Christopher R. Knittel. "Are Fuel Economy Standards Regressive?" ***Journal of the Association of Environmental and Resource Economists***, 6(1), March 2019, pp. 37-63.
- Allcott, Hunt and Christopher R. Knittel. "Are Consumers Poorly Informed About Fuel Economy? Evidence from Two Experiments." ***The American Economic Journal: Economic Policy***, 11(1), February 2019, pp. 1-37.
- Bento, Antonio M., Kenneth Gillingham, Mark R. Jacobsen, Christopher R. Knittel, Benjamin Leard, Joshua Linn, Virginia McConnell, David Rapson, James M. Sallee, Arthur A. van Benthem, and Kate Whitefoot. "Flawed analyses of U.S. auto fuel economy standards." ***Science***, 363, December 2018, pp. 1119-1121.
- Knittel, Christopher R. and Ryan Sandler. "The Welfare Impact of Second-Best Uniform-Pigouvian Taxation: Evidence from Transportation." ***The American Economic Journal: Economic Policy,*** 10(3), November 2018, pp. 211-242.
- Knittel, Christopher R., Ben Meiselman, and James Stock. "The Pass-Through of RIN Prices to Wholesale and Retail Fuels under the Renewable Fuel Standard," ***Journal of the Association of Environmental and Resource Economists***, 4(4), December 2017, pp. 1081-1119.
- Blonigen, Bruce A., Knittel, Christopher R., and Anson Soderbery. "Keeping it Fresh: Strategic Product Redesigns and Welfare." ***International Journal of Industrial Organization***, 53, July 2017, pp. 170-214.
- Bushnell, James, Stephen Holland, Jonathan Hughes, Christopher R. Knittel. "Strategic Policy Choice in State-Level Regulation: The EPA's Clean Power Plan." ***The American Economic Journal: Economic Policy,*** 9(2), May 2017, pp. 57-90.
- Covert, Thomas, Michael Greenstone, and Christopher R. Knittel. "Will We Ever Stop

Using Fossil Fuels?" ***Journal of Economic Perspectives***, 30(1), Winter 2016, pp. 117-138.

- Gandhi, Raina, Christopher R. Knittel, Paula Pedro, and Catherine Wolfram. "Running Randomized Field Experiments for Energy Efficiency Programs." ***Economics of Energy & Environmental Policy***, 5(2), September 2016.
- Knittel, Christopher R., Konstantinos Metaxoglou, and Andre Trindade. "Are we fracked? The impact of falling gas prices and the implications for coal-to-gas switching and carbon emissions." ***Oxford Review of Economic Policy***, 32(2), Summer 2016, pp. 241-259.
- Knittel, Christopher R., Douglas L. Miller and Nicholas J. Sanders. "Caution Drivers! Children Present: Traffic, pollution and infant health." ***The Review of Economics and Statistics***, 98(2), May 2016, pp. 350-366.
- Knittel, Christopher R. and Robert S. Pindyck. "The Simple Economics of Commodity Price Speculation." ***The American Economic Journal: Macroeconomics***, 8(2), April 2016, pp. 85-110.
- Busse, Meghan, Christopher R. Knittel, Jorge Silva-Risso, and Florian Zettelmeyer. "Who is Exposed to Gas Prices? How Gasoline Prices Affect Automobile Manufacturers and Dealerships." ***Quantitative Marketing and Economics***, 14(1), March 2016, pp. 41-95.
- Knittel, Christopher R., Konstantinos Metaxoglou. "Working with Data: Two Empiricists' Experience," ***Journal of Econometric Methods***, March 2016.
- Holland, Stephen P., Jonathan E. Hughes, Christopher R. Knittel, and Nathan C. Parker. "Some Inconvenient Truths About Climate Change Policy: The Distributional Impacts of Transportation Policies." ***Review of Economics and Statistics***, 97(5), December 2015, pp. 1052-1069.
- Holland, Stephen P., Jonathan E. Hughes, Christopher R. Knittel, and Nathan C. Parker. "Unintended Consequences of Transportation Carbon Policies: Land-Use, Emission, and Innovation," joint with Stephen P. Holland (UNC), Jonathan E. Hughes (Colorado), and Nathan Parker (UC Davis--ITS). ***The Energy Journal,*** 36(3), July 2015.
- Allcott, Hunt, Christopher R. Knittel, and Dmitry Taubinsky. "Tagging and Targeting of Energy Efficiency Subsidies." ***The American Economic Review, Papers & Proceedings***, 105(3), May 2015.
- Knittel, Christopher R. and Aaron Smith. "Ethanol Production and Gasoline Prices: A Spurious Correlation." ***The Energy Journal***, 36(1), January 2015.
- Fowlie, Meredith, Lawrence Goulder, Matthew Kotchen, Severin Borenstein, James Bushnell, Lucas Davis, Michael Greenstone, Charles Kolstad, Christopher Knittel, Robert Stavins, Michael Wara, Frank Wolak, Catherine Wolfram. "An economic perspective on the EPA's Clean Power Plan." ***Science***, November 2014, 346 (6211), pp. 815-816.
- Rouhani, Omid M., Christopher R. Knittel, and Debbie Niemeier, "Road Supply In Central London: Addition Of An Ignored Social Cost." ***Journal of the Transportation Research Forum***, 53(1), March 2014.
- Knittel, Christopher R. "The Origins of US Transportation Policy: Was There Ever Support for Gasoline Taxes?" ***Tax Policy and the Economy***, 2014, pp 97-131.

- Knittel, Christopher R. and Konstantinos Metaxoglou. "Estimation of Random Coefficient Demand Models: Two Empiricists' Perspective." ***The Review of Economics and Statistics***, 96(1), March 2014, pp. 34-59.
- Knittel, Christopher R. "Transportation Fuels Policy Since the OPEC Embargo: Paved with Good Intentions." ***The American Economic Review, Papers & Proceedings***, 103(3), May 2013.
- Knittel, Christopher R. and Victor Stango. "Celebrity Endorsements, Firm Value and Reputation Risk: Evidence from the Tiger Woods Scandal." ***Management Science***, 60(1), January 2014, pp. 21-37.
- Busse, Meghan, Christopher R. Knittel and Florian Zettelmeyer. "Are Consumers Myopic? Evidence from New and Used Car Purchases." ***The American Economic Review***, 103(1), February 2013, pp. 220-256.
- Knittel, Christopher R. "Reducing Petroleum Use from Transportation." ***The Journal of Economic Perspectives***, 26(1), Winter 2012, 93-118.
- Fowlie, Meredith, Christopher R. Knittel and Catherine Wolfram. "Sacred Cars: Optimal Regulation of Stationary and Non-stationary Pollution Sources." ***The American Economic Journal: Economic Policy***, 4(1), February 2012, 98-126.
- Knittel, Christopher R. "Automobiles on Steroids: Product Attribute Trade-offs and Technological Progress in the Automobile Sector." ***The American Economic Review,*** 101(7), 2011, pp. 3368-3399.
- Knittel, Christopher R. and Konstantinos Metaxoglou. "Challenges in Merger Simulation Analysis," ***The American Economic Review, Papers & Proceedings***, 101(3), May 2011, pp. 56-59.
- Knittel, Christopher R. and Victor Stango. "Strategic Incompatibility in ATM Markets." ***The Journal of Banking and Finance***, 35(10), October 2011, pp. 2627-2636.
- Knittel, Christopher R. and Jason J. Lepore. "Tacit Collusion in the Presence of Cyclical Demand and Endogenous Capacity Levels." ***The International Journal of Industrial Organization***, 28(2), March 2010, pp. 131-144.
- Stewart, Scott, John J. Neumann, Christopher R. Knittel, and Jeffrey Heisler. "Absence of Value: An Analysis of Investment Allocation Decisions by Institutional Plan Sponsors," ***Financial Analyst Journal***, 65(6), November/December 2009. *Winner of the Graham and Dodd Award of Excellence.*
- Knittel, Christopher R. and Victor Stango. "How Does Incompatibility Affect Prices?: Evidence from ATMs," ***The Journal of Industrial Economics***, LVII(3), September 2009, pp. 557-582.
- Holland, Stephen P., Jonathan E. Hughes and Christopher R. Knittel. "Greenhouse Gas Reductions under Low Carbon Fuel Standards?," ***The American Economic Journal: Economic Policy,*** 1(1), February 2009, pp. 106-146.
- Borenstein, Severin, James Bushnell, Christopher R. Knittel and Catherine Wolfram. "Trading Inefficiencies in California's Electricity Markets," ***The Journal of Industrial Economics***, LVI(2), June 2008, pp. 347-378.
- Feenstra, Robert and Christopher R. Knittel. "Re-Assessing the Quality Adjustment to Computer Prices: Do U.S. Procedures Overstate the Gains?," ***Price Index Concepts and Measurement***, NBER and the Chicago Press.

- Knittel, Christopher R. and Konstantinos Metaxoglou. "Diagnosing Unilateral Market Power in Electricity Reserves Market," ***The Journal of Energy Markets***, 1(1), Spring 2008.
- Knittel, Christopher R. and Victor Stango. "Incompatibility, Product Attributes and Consumer Welfare: Evidence from ATMs," ***The BE Journal of Economic Analysis & Policy, Advances***, 8(1), January 2008.
- Hughes, Jonathan E., Christopher R. Knittel and Daniel Sperling. "Evidence of a Shift in the Short-Run Price Elasticity of Gasoline." ***The Energy Journal***, 29(1), January 2008.
- Heisler, Jeffrey, Christopher R. Knittel, John J. Neumann and Scott Stewart. "Why Do Institutional Plan Sponsors Hire and Fire their Investment Managers?" *Best Paper Award for the 31st NBEA Conference*. ***The Journal of Business and Economics Studies***, 13(1), Spring 2007, pp. 88-116.
- Kim, Dae-Wook and Christopher R. Knittel "Biases in Static Oligopoly Models? Evidence from the California Electricity Market," ***The Journal of Industrial Economics***, LIV(4), December 2006, pp. 451-470.
- Knittel, Christopher R. "The Adoption of State Electricity Regulation: The Role of Interest Groups," ***The Journal of Industrial Economics***, LIV(2), June 2006.
- Knittel, Christopher R. and Michael R. Roberts. "Financial Models of Deregulated Electricity Prices: An Application to the California Market," ***Energy Economics***, 27(5), September 2005, pp. 791-817.
- Knittel, Christopher R. "Regulatory Restructuring and Incumbent Price Dynamics: The Case of Local Telephone Markets," ***Review of Economics and Statistics,*** 86(2), May 2004, pp. 614-625.
- Knittel, Christopher R. and Victor Stango. "Price Ceilings as Focal Points for Tacit Collusion: Evidence from the Credit Card Market," ***The American Economic Review***, 93(5), December 2003, pp. 1703-1729.
- Knittel, Christopher R. "Market Structure and the Pricing of Electricity and Natural Gas," ***The Journal of Industrial Economics***, LI(2), June 2003, pp. 167-191.
- Knittel, Christopher R. "Alternative Regulatory Methods and Firm Efficiency: Stochastic Frontier Evidence the US Electricity Industry," ***Review of Economics and Statistics***, 84(3), August 2002, pp. 530-540.
- Borenstein, Severin, James Bushnell, and Christopher R. Knittel. "Market Power in Electricity Markets: Beyond Concentration Measures," ***The Energy Journal,*** 20(4), October 1999, pp. 65-88.
- Knittel, Christopher R. "Interstate Long Distance Rates: Search Costs, Switching Costs, and Market Power," ***Review of Industrial Organization***, 12(4), August 1997, pp. 519-536.

WORKING PAPERS:

- Cole, Cassandra, Michael Droste, Christopher R. Knittel, Shanjun Li, and James H. Stock. "Policies for Electrifying the Light-Duty Vehicle Fleet in the United States."
- Dimanchev, Emil and Christopher R. Knittel. "Designing Climate Policy Mixes: Analytical and Energy Systems Modeling Approaches." Revisions requested from ***The Energy Journal***.
- Burger, Scott P., Christopher R. Knittel, and Ignaco J. Perez-Arriaga. "Quantifying the Distributional Impacts of Rooftop Solar PV Adoption Under Net Energy Metering."

- Green, Tomas and Christopher R. Knittel. "Distributed Effects of Climate Policy: A Machine Learning Approach."
- Knittel, Christopher R. and Sam Stolper. "Using Machine Learning to Target Treatment: The Case of Household Energy Use." Second round of revisions requested from ***The Economic Journal.***
- Knittel, Christopher R. and Bora Ozaltun. "What Does and Does Not Correlate with COVID-19 Death Rates."
- Knittel, Christopher R. and Elizabeth Murphy. "Generational Trends in Vehicle Ownership and Use: Are Millennials Any Different?" Revisions requested from ***The Energy Journal***.
- Busse, Meghan, Christopher R. Knittel and Florian Zettelmeyer. "Did `Cash for Clunkers' Deliver? The Consumer Effects of the Car Allowance Rebate System." Revisions requested from ***The American Economic Journal: Economic Policy.***
- Busse, Meghan, Christopher R. Knittel and Florian Zettelmeyer. "Stranded Vehicles: The Incidence of Gasoline Taxes Through the Lens of Vehicle Values."

AWARDS, HONORS, AND GRANTS:

- National Science Foundation (with Anuradha Annaswamy and Ignacio Perez-Arriaga). 2014-2017, $1,783,855
- Graham and Dodd Award of Excellence, from ***Financial Analyst Journal***, 2010.
- Tom Mayer Distinguished Teaching Award, 2010
- Chancellor's Fellowship, UC Davis (one of five faculty members), 2008
- Barry D. McNutt Award for Excellence in Automotive Policy Analysis (with Jonathan Hughes and Dan Sperling), 2008
- National Science Foundation Grant (with Victor Stango), 2008-2010, $240,000
- Chevron Bio-Fuel Research Grant, 2007-2008, $127,000
- Chevron Bio-Fuel Research Grant, 2007-2008, $77,000
- Chevron Bio-Fuel Research Grant (Co-PI), 2007-2009, $370,000
- Woods Institute for the Environment Leadership Scholar Training, 2007
- Distinguished Paper, 2006 Academy of Finance
- University of California Energy Institute Research Grant, 2005-2006, $50,000
- Best Paper Award for the 31st NBEA Conference
- ASUCD Excellence in Teaching Award, 2004
- University of California Energy Institute Research Grant, 2003
- Faculty Research Grant, UC Davis, 2002, 2003, 2004, 2005, 2006
- Institute of Governmental Affairs Junior Faculty Grant, 2002, 2003, 2004, 2005
- Junior Faculty Research Grant, Boston University, 2001
- Graduate Fellowship, University of California, Berkeley, 1997–1999
- Graduate Fellowship, University of California, Davis, 1994–1996
- Institute of Transportation Fellow, University of California, Davis, 1995–1996
- Student Commencement Speaker, California State University, Stanislaus, 1994

REFEREE SERVICES:

Agricultural Economics, American Economic Review, Bulletin of Economic Research, Census Bureau, *Econometrica, Economic Inquiry, The Economic Journal, Economics Letters, Energy Economics, The Energy Journal, Energy Studies Review, European Economic Review, International Journal of Industrial Organization, International Journal*

of Power and Energy Systems, Journal of Banking and Finance, The Journal of Business, Journal of Business and Economic Statistics, Journal of Economic Behavior and Organization, Journal of Economic Education, Journal of Economics and Management Strategy, Journal of Futures Markets, Journal of Industrial Economics, Journal Institutional and Theoretical Economics, Journal of Law and Economics, Journal of Political Economy, Politics and Economics, Quarterly Journal of Economics, Rand Journal of Economics, Resource and Energy Economics, Review of Economic Studies, Review of Economics and Statistics, Review of Industrial Organization, Review of Network Economics, Southern Economic Journal, Socio-Economic Planning Sciences, Utilities Policy, University of California Energy Institute Grant Program, NSF Grant Program

REGULATORY FILINGS:

- Arons, S.M., A.R. Brandt, M.A. Delucchi, A. Eggert, A.E. Farrell, B.K. Haya, J. Hughes, B.M. Jenkins, A.D. Jones, D.M. Kammen, S.R. Kaffka, C.R. Knittel, D.M. Lemoine, E.W. Martin, M.W. Melaina, J.M. Ogden, R.J. Plevin, D. Sperling, B.T. Turner, R.B. Williams, C. Yang, 2007. "A Low-Carbon Fuel Standard for California, Part 1: Technical Analysis." Available Online: http://www.lcfs.ucdavis.edu.
- Brandt, A.R., A.E. Farrell, B.K. Haya, J. Hughes, B.M. Jenkins, A.D. Jones, D.M. Kammen, C.R. Knittel, M.W. Melaina, M. O'Hare, R.J. Plevin, D. Sperling, 2007. "A Low-Carbon Fuel Standard for California, Part 2: Policy Analysis." Available Online: http://www.lcfs.ucdavis.edu.
- Peer Review Comments on AB 1493, California Environmental Protection Agency Air Resource Board, September 2004.
- "Comments on the Use of Computer Models for Merger Analysis in the Electricity Industry," (Joint with Severin Borenstein and James Bushnell), Federal Energy Regulatory Commission. Docket No. PL98-6-000, June 1998.
- "A Cournot-Nash Equilibrium Analysis of the New Jersey Electricity Market," December 1997. (Joint with Severin Borenstein and James Bushnell). Filed with the New Jersey Public Utility Commission as testimony on the potential for market power in a deregulated Pennsylvania-Jersey-Maryland Power Pool.

PH.D. AND M.A. COMMITTEES (FIRST JOB):

Harvard:
Shefali Khanna (on going)
Jing Li (MIT)

MIT:
Nestor Sepulveda (Nuclear Science, McKinsey)
Andre Besio (MA, Engie)
Bora (MA, Microsoft)
Benny Ng (MA, Microsoft)
Sruthi Davuluri (MA, E3)
Scott Burger (MIT)
Nick Hagerty (UCB)
Stephen Zoepf (MIT)
Ricardo Charles (MA, DOE)
Parisa Bastini (Cambridge University)

Donald MacKenzie (University of Washington)
Jennifer Peck (Swarthmore)

UC Davis:
Anson Soderbery (Purdue University)
Nick Sanders (chair, SIEPR Post Doc, Stanford University)
Chia-Wen Chen (chair, on-going)
Chenguang Li (University of Wisconsin)
Jonathan Hughes (chair, University of Colorado, Boulder)
Adib Bagh (University of Kentucky, Math and Economics)
Seungjoon Lee (Korean Insurance Research Institute)
Jason Lepore (chair, Cal Poly)
Wei-Min Hu (Peking University)
Byeongil Ahn (Gyeongsang University)
Konstantinos Metaxoglou (chair, Bates and White LLC)
Lan Li (University of Melbourne)
Neil Norman (Cornerstone Research)
Dae-Wook Kim (chair, Korean Institute for Industrial Economics and Trade)
Boston University:
Gustavo Genoni (2002, Finance, IAE, School of Business, Universidad Austral)
John Neumann (2003, Finance, St. John's University)

TEACHING:

- MIT
    - Energy Economics and Policy, MBA (10 times)
        - Rating: Mean 6.66/Median 7 (out of 7)
        - Sloan Rating: 4.8 out of 5
    - Energy Economics and Policy, Undergraduate (9 times)
        - Rating: Mean 6.66/Median 7 (out of 7)
    - Applied Economics for Manager, Executive MBAs (4 times)
        - Rating: Mean 6.44/Median 7 (out of 7)
        - Sloan Rating: 4.7 out of 5
- UC Davis
    - Graduate Empirical Industrial Organization (6 times)
        - Ratings: Mean 4.9 (out of 5)
    - Transportation Economics (4 times)
        - Ratings: Mean 4.7
    - Intermediate Microeconomics (1 time),
        - Ratings: Mean 4.8
    - Undergraduate Industrial Organization (9 times)
        - Ratings: Mean 4.8
- Boston University
    - Modeling Business Decision Making (3 times)
        - Ratings: 4.7 (out of 5)
    - Modeling Business Decision Making (honors, 2 times),
        - Ratings: 4.8

UNIVERSITY SERVICE:

MIT:
Variety of personnel committees
Executive Personnel Committee, 2020-present
Asia Business School Board of Governors, 2019-present
Energy Minor Oversight Committee, 2011-present
Energy Education Task Force, 2011-present
Executive Education Committee, 2018-2020

UC Davis:
2007-2008, Co-writer (with Jean VanderGheynst) of a proposal for a Graduate Program in "Energy Science and Technology" and "Energy Policy and Management"
2006-Present, Member, Energy Institute Steering Committee
2008, Founding Faculty Member, UC Davis Energy Institute
2005-2006, Hiring Committee and Interviewing Committee
2004-2005, Hiring Committee and Interviewing Committee
2002-2003, Hiring Committee and Interviewing Committee
2002-2007, Graduate Advisor
Oral committees: Dae-Wook Kim, Konstantinos Metaxoglou, Neil Norman (chair), Seungjoon Lee, Wei-Min Hu, Lan Li (ARE), Sunhwa Lee, Byeongil Ahn (ARE), Michele Amaral, David Ong, Adib Bagh, Jason Lepore, Bei Li, Chenguang Li (ARE), Tina Saitone (ARE), Carlo Russo (ARE), Sandhya Patlolla (ARE), Jon Hughes (TTP), Peter Huckfeldt, Kyungwon Rho, Nick Sanders, Chia-Wen Chen, Joeri de Witt (ARE), In-Sung Lee (TTP), Anson Soderbery, Nils Johnson (TTP), David McCollum (TTP)

Boston University:
2000-2001, Finance Hiring Committee and Interviewing Committee
1999-2000, Finance Hiring Committee

DEPOSITIONS AND LEGAL TESTIMONY IN THE LAST FOUR YEARS:

- *The People of the State of California vs. Vitol Inc.; SK Energy Americas, Inc.; SK Trading International Co., Ltd.*
  Superior Court of the State of California for the County of San Francisco
  Case No. CGC-20-584456
  Role: Deposition (April 25, 2023)
- *Jeffrey Koenig, on behalf of himself and all others similarly situated, vs. Vizio, Inc.*
  Superior Court of the State of California for the County of Los Angeles
  Case No. BC702266
  Role: Deposition (December 14, 2021)
- *Economic Regulation Authority v. Electricity Generation and Retail Corporation (t/a Synergy)*
  Western Australia Electricity Review Board
  Application 1/2019
  Role: Expert Testimony (May 13, 2021)

Appendix B
Materials Considered

Expert Reports and Legal Documents

- Anibal Rodriguez, Sal Cataldo, Julian Santiago, and Susan Lynn Harvey, individually and on behalf of all other similarly situated, v. Google, LLC, Fourth Amended Complaint, 3:20-cv-04688-RS, January 4, 2023.
- Anibal Rodriguez and Julie Anna Muniz, individually and on behalf of all other similarly situated, vs. Google LLC, et al., Defendant Google LLC's Fourth Supplemental Responses and Objections to Plaintiffs' Interrogatories, Set One, 3:20-cv-04688, November 5, 2021.
- Anibal Rodriguez and Julie Anna Muniz, individually and on behalf of all other similarly situated, vs. Google LLC, et al., Defendant Google LLC's Second Supplemental Responses and Objections to Plaintiffs' Interrogatories, Set Two, 3:20-cv-04688, August 16, 2021.
- Anibal Rodriguez and Julie Anna Muniz, individually and on behalf of all other similarly situated, vs. Google LLC, et al., Defendant Google LLC's Second Supplemental Responses and Objections to Plaintiffs' Interrogatories, Set Three, 3:20-cv-04688, October 31, 2022.
- Anibal Rodriguez and Julie Anna Muniz, individually and on behalf of all other similarly situated, vs. Google LLC, et al., Defendant Google LLC's Responses to Plaintiffs' Interrogatories, Set Four, 3:20-cv-04688, July 21, 2021.
- Anibal Rodriguez and Julie Anna Muniz, individually and on behalf of all other similarly situated, vs. Google LLC, et al., Defendant Google LLC's Objections to Plaintiffs' Interrogatories, Set Five, 3:20-cv-04688, October 25, 2021.
- Anibal Rodriguez and Julie Anna Muniz, individually and on behalf of all other similarly situated, vs. Google LLC, et al., Defendant Google LLC's Second Supplemental Objections and Responses to Plaintiffs' Interrogatories, Set Six, 3:20-cv-04688, February 14, 2023.
- Anibal Rodriguez and Julie Anna Muniz, individually and on behalf of all other similarly situated, vs. Google LLC, et al., Defendant Google LLC's Objections and Responses to Plaintiffs' Interrogatories, Set Seven, 3:20-cv-04688, October 31, 2022.
- Expert Rebuttal Report of Anindya Ghose, Ph.D., May 31, 2023.
- Expert Report of Donna L. Hoffman, May 31, 2023.
- Expert Report of Jonathan E. Hochman, March 22, 2023.
- Expert Report of Michael J. Lasinski, and materials considered, February 20, 2023.

Depositions

- Deposition of Anibal Rodriguez, October 16, 2022.
- Deposition of Arne De Booij, February 7, 2023.
- Deposition of Belinda Langner, December 15, 2022.
- Deposition of Christopher Ruemmler, September 9, 2022.
- Deposition of Daniel Stone, November 15, 2022.
- Deposition of David Monsees, September 15, 2022.
- Deposition of Edward Weng, September 23, 2022.
- Deposition of Eric Miraglia, October 25, 2022.
- Deposition of Francis Ma, October 28, 2022.
- Deposition of Greg Fair, October 3, 2022.
- Deposition of Julian Santiago, March 7, 2022.
- Deposition of Rahul Oak, November 18, 2022.
- Deposition of Sal Cataldo, February 17, 2022.
- Deposition of Sam Heft-Luthy, February 8, 2023.
- Deposition of Steve Ganem, October 28, 2022.
- Deposition of Susan Harvey, October 29, 2022.
- Deposition of Xinyu Ye, February 9, 2023.

Appendix B
Materials Considered

Bates Stamped Documents

- GOOG-RDGZ-00030019–023.
- GOOG-RDGZ-00046896–933.
- GOOG-RDGZ-00056108–129.
- GOOG-RDGZ-00056514–531.
- GOOG-RDGZ-00067439–474.
- GOOG-RDGZ-00072319–365.
- GOOG-RDGZ-00118124–129.
- GOOG-RDGZ-00177709–741.
- GOOG-RDGZ-00184247.
- GOOG-RDGZ-00185744.
- GOOG-RDGZ-00187010.
- GOOG-RDGZ-00187249–303.
- GOOG-RDGZ-00187331–571.
- GOOG-RDGZ-00187623.
- GOOG-RDGZ-00187665.
- GOOG-RDGZ-00187666.
- GOOG-RDGZ-00188469–491.
- GOOG-RDGZ-00188655.
- GOOG-RDGZ-00188768.
- GOOG-RDGZ-00196222–259.
- GOOG-RDGZ-00199151–191.
- GOOG-RDGZ-00202698–713.
- GOOG-RDGZ-00204475.
- GOOG-RDGZ-00204559–589.

Academic Literature

- Allen, Mark A., Robert E. Hall, and Victoria A. Lazear, "Reference Guide on Estimation of Economic Damages," Reference Manual on Scientific Evidence, Third Edition, 2011, pp. 425–502.
- Goldfarb, Avi, and Catherine E. Tucker, "Privacy Regulation and Online Advertising," Management Science, Vol. 57, No. 1, 2011, pp. 57–71.
- Hubbard, Glenn R., and Anthony Patrick O'Brien, "Microeconomics," Seventh Edition, Pearson, 2019.
- Johnson, Garrett A., Scott K. Shriver, and Shaoyin Du, "Consumer privacy choice in online advertising: Who opts out and at what cost to industry?," Marketing Science, 2020, Vol. 39, Issue 1, 33–51.

Publicly Available Documents

- "About App campaigns," Google Ads Help, available at https://support.google.com/google-ads/answer/6247380?hl=en.
- "About attribution models," Google Ads Help, available at https://support.google.com/google-ads/answer/6259715?hl=en.
- "About attribution sharing for App campaigns," Google Ads Help, available at https://support.google.com/google-ads/answer/9996103?hl=en.
- "About automated bidding," Google Ads Help, available at https://support.google.com/google-ads/answer/2979071?hl=en.
- "About conversion tracking," Google Ads Help, available at https://support.google.com/google-ads/answer/1722022.

Appendix B
Materials Considered

Publicly Available Documents (Cont'd)

- "About Display ads and the Google Display Network," Google Ads Help, available at https://support.google.com/google-ads/answer/2404190?hl=en.
- "About mobile app conversion tracking," Google Ads Help, available at https://support.google.com/google-ads/answer/6100665.
- "About mobile app install ads," Google Ads Help, available at https://support.google.com/google-ads/answer/6357635.
- "About modeled online conversions," Google Ads Help, available at https://support.google.com/google-ads/answer/10081327?hl=en.
- "About the Google Search Network," Google Ads Help, available at https://support.google.com/google-ads/answer/1722047.
- "About tracking app conversions with an App Attribution Partner," Google Ads Help, available at https://support.google.com/google-ads/answer/12961402?hl=en.
- "Ad Revenue: What Is and How to Increase it?," CodeFuel, June 29, 2021, available at https://www.codefuel.com/blog/ad-revenue/.
- "Advertising with Google Ad Manager," Google Ad Manager Help, available at https://support.google.com/admanager/answer/6022000?hl=en.
- "Automated bid strategy: Definition," Google Ads Help, available at https://support.google.com/google-ads/answer/6325042?hl=en.
- "Best practices guide: Drive better performance and measurement for iOS App campaigns," Google Ads Help, available at https://support.google.com/google-ads/answer/10384955?hl=en.
- "Choose your bid and budget," Google Ads Help, available at https://support.google.com/google-ads/answer/2375454?hl=en.
- "Click: Definition," Google Ads Help, available at https://support.google.com/google-ads/answer/31799?hl=en.
- "Cloud Connect: Google Apps," Google Help Center, available at https://www.google.com/support/enterprise/static/gsa/docs/admin/70/admin_console_help/cloud_google_apps.html.
- "Compare Ad Manager, AdSense, and AdMob," Google Ad Manager Help, available at https://support.google.com/admanager/answer/9234653?hl=en.
- "Complete guide to Google App Campaigns ad formats and assets," App Radar, available at https://appradar.com/academy/google-app-campaign/ad-assets-and-creatives.
- "Consumers care about sustainability—and back it up with their wallets," McKinsey and Company, February 6, 2023, available at https://www.mckinsey.com/industries/consumer-packaged-goods/our-insights/consumers-care-about-sustainability-and-back-it-up-with-their-wallets.
- "Conversion tracking: Definition," Google Ads Help, available at https://support.google.com/google-ads/answer/6308?hl=en.
- "Conversion: Definition," Google Ads Help, available at https://support.google.com/google-ads/answer/6365.
- "DSP, SSP, and Ad Exchange: What is the Difference?," AARKI, available at https://www.aarki.com/insights/dsp-ssp-and-ad-exchange-what-is-the-difference.
- "Earn more revenue with your apps," Google AdMob, available at https://admob.google.com/home/.
- "Events," Google Tags, available at https://developers.google.com/tag-platform/devguides/events.
- "FAQ," Google Ads, available at https://ads.google.com/intl/en_id/home/faq/.
- "Find the Google Play Store app," Google Play Help, available at https://support.google.com/googleplay/answer/190860?hl=en.
- "Firebase," Firebase, available at https://firebase.google.com/.
- "First click, linear, time decay, and position-based attribution models are going away," Google Ads Help, April 6, 2023, available at https://support.google.com/google-ads/answer/13427716?hl=en.

Appendix B
Materials Considered

Publicly Available Documents (Cont'd)

- "Get started with AdMob in your iOS project," Firebase, available at https://firebase.google.com/docs/admob/ios/quick-start.
- "Get the Most Out of Your Bid in the Facebook Ad Auction," Facebook Business, January 16, 2018, available at https://webcache.googleusercontent.com/search?q=cache%3AKbNJo6yNpVkJ%3Ahttps%3A%2F%2Fwww.facebook.com%2Fbusiness%2Fnews%2Fget-the-most-out-of-your-bid-in-the-facebook-ad-auction&cd=4&hl=en&ct=clnk&gl=us.
- "Google AdMob ad revenue attribution configuration," AppsFlyer Help Center, May 14, 2023, available at https://support.appsflyer.com/hc/en-us/articles/360006951817-Google-AdMob-ad-revenue-attribution-configuration.
- "Google Analytics for Firebase Free and unlimited app analytics," Firebase, available at https://firebase.google.com/products/analytics.
- "Google Display Network and YouTube on computers, mobile devices, and tablets," Google Ads Help, available at https://support.google.com/google-ads/answer/2740623?hl=en.
- "Google Panel Privacy Policy," Ipsos Screenwise Panel, available at https://screenwisepanel.com/google-panel-privacy-policy.
- "Google Panel Terms & Conditions," Ipsos Screenwise Panel, available at https://screenwisepanel.com/google-panel-terms-condition.
- "How AdMob works," Google AdMob Help, available at https://support.google.com/admob/answer/7356092?hl=en.
- "How Google Play works," Google Play, available at https://play.google.com/about/howplayworks/.
- "How it Works," Super Savvy, available at https://www.surveysavvy.com/how_it_works.
- "Impressions: Definition," Google Ads Help, available at https://support.google.com/google-ads/answer/6320?hl=en.
- "Install and use Android apps on your Chromebook," Google Play Help, available at https://support.google.com/googleplay/answer/7021273?hl=en.
- "iOS 14 is available today," Apple, September 16, 2020, available at https://www.apple.com/newsroom/2020/09/ios-14-is-available-today/.
- "Liu v. SEC: Supreme Court Affirms SEC's Disgorgement Authority But Imposes Limitations," White & Case, June 24, 2020, available at https://www.whitecase.com/insight-alert/liu-v-sec-supreme-court-affirms-secs-disgorgement-authority-imposes-limitations.
- "Manual CPC Bidding," Google Ads Help, available at https://support.google.com/google-ads/answer/2390250?hl=en.
- "Market share of leading mobile operating systems in Europe from 2010 to 2021," Statista, January 2022, available at https://www.statista.com/statistics/639928/market-share-mobile-operating-systems-eu/.
- "Market share of mobile operating systems in the United States from January 2012 to March 2023," Statista, March 2023, available at https://www.statista.com/statistics/272700/market-share-held-by-mobile-operating-systems-in-the-us-since-2009/.
- "Mobile Ads SDK," Google Ad Manager, available at https://developers.google.com/ad-manager/mobile-ads-sdk.
- "Multiple device ownership means more smartphone usage," Kantar, September 23, 2021, available at https://cdne.kantar.com/north-america/inspiration/technology/multiple-device-ownership-means-more-smartphone-usage.
- "Multi-Touch Attribution: What It Is & How To Use It," Marketing Evolution, July 20, 2022, available at https://www.marketingevolution.com/marketing-essentials/multi-touch-attribution.
- "Nielsen Computer and Mobile Panel," Nielsen, available at https://computermobilepanel.nielsen.com/ui/US/en/sdp/landing.
- "Nielsen U.S. Panel Privacy Notice Summary," Nielsen, available at https://computermobilepanel.nielsen.com/ui/US/en/privacypolicyen.html.

Appendix B
Materials Considered

Publicly Available Documents (Cont'd)

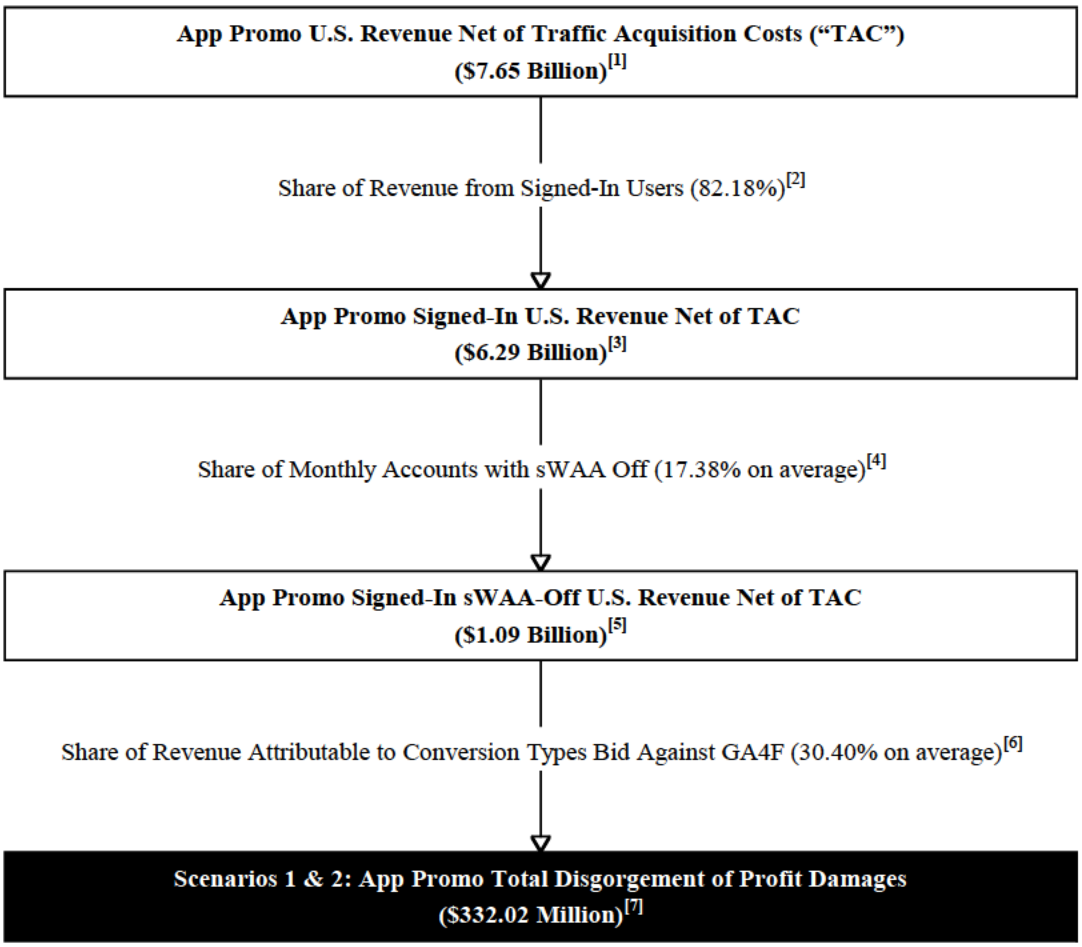
- "Overview of apps with Ad Manager," Google Ad Manager Help, available at https://support.google.com/admanager/answer/6238688.
- "Partner with a creative agency to maximize your ad's impact," Google Ads, available at https://ads.google.com/home/resources/advanced/agency-directory/.
- "Percentage of U.S. adults who own a smartphone from 2011 to 2021," Statista, April 2021, available at https://www.statista.com/statistics/219865/percentage-of-us-adults-who-own-a-smartphone/.
- "Privacy Policy - United States, DoorDash - General Privacy Policy," DoorDash, January 3, 2023, available at https://help.doordash.com/legal/document?type=cx-privacy-policy&region=US&locale=en-US.
- "Privacy Policy," AccuWeather, August 21, 2020, available at https://www.accuweather.com/en/privacy.
- "Privacy Policy," Applebee's, April 1, 2023, available at https://www.applebees.com/en/privacy-policy.
- "Privacy Policy," Little Caesars, January 1, 2023, available at https://littlecaesars.com/en-us/legal/privacy-policy.
- "Reach a larger or new audience with Google Display Network targeting," Google Ads, available at https://ads.google.com/intl/en_id/home/resources/reach-larger-new-audiences/.
- "Real Time Bidding Market," Markets and Markets, March 2019, available at https://www.marketsandmarkets.com/Market-Reports/real-time-bidding-market-4630735.html.
- "See & control your Web & App Activity," Google Search Help, March 7, 2020, available at https://web.archive.org/web/20200307144113/https://support.google.com/websearch/answer/54068?hl=en&co=GENIE.Platform%3DAndroid (accessed using the Wayback Machine).
- "Set up conversions from Firebase or App Attribution Partners for App campaigns for engagement," Google Ads Help, available at https://support.google.com/google-ads/answer/9260620.
- "Share of ad-selling companies in the total digital advertising revenue in the United States from 2020 to 2025," Statista, May 2023, available at https://www.statista.com/statistics/242549/digital-ad-market-share-of-major-ad-selling-companies-in-the-us-by-revenue/.
- "Simple guide to conversion tracking for Google App Campaigns," App Radar, available at https://appradar.com/academy/google-app-campaign/conversion-tracking.
- "SKAdNetwork," Apple Developer, available at https://developer.apple.com/documentation/storekit/skadnetwork.
- "Smart Bidding: Definition," Google Ads Help, available at https://support.google.com/google-ads/answer/7066642?hl=en.
- "Target Privacy Policy," Target, December 31, 2022, available at https://www.target.com/c/target-privacy-policy/-/N-4sr7p.
- "The Complete Guide to Ad Monetization," Playwire, available at https://www.playwire.com/ad-monetization.
- "The DoubleClick Ad Exchange," Google, available at https://static.googleusercontent.com/media/www.google.com/en//adexchange/AdExchangeOverview.pdf.
- "Track app conversions with the Google Ads SDK or a server-to-server connection," Google Ads Help, available at https://support.google.com/google-ads/answer/6095881?hl=en.
- "Track app conversions with third-party app analytics," Google Ads Help, available at https://support.google.com/google-ads/answer/7382633?hl=en.
- "US Time Spent with Mobile 2019," eMarketer, May 30, 2019, available at https://www.insiderintelligence.com/content/us-time-spent-with-mobile-2019.
- "What is AdMob," Google AdMob, available at https://admob.google.com/home/resources/what-is-admob/.
- "What is adtech and why is it important?," Amazon Ads, available at https://advertising.amazon.com/library/guides/what-is-adtech.
- "What is marketing attribution? A beginner's guide," Amazon Ads, available at https://advertising.amazon.com/library/guides/marketing-attribution.

Appendix B
Materials Considered

Publicly Available Documents (Cont'd)

- "What Is Programmatic Advertising and How Does It Work?," Publift, February 3, 2023, available at https://www.publift.com/adteach/what-is-programmatic-advertising.
- "What is Real-Time Bidding (RTB)? Definition and Importance," Amazon Ads, available at https://advertising.amazon.com/library/guides/real-time-bidding.
- "Your guide to conversion modeling: Introduction," Google Ads Help, available at https://support.google.com/google-ads/answer/12445061?hl=en.
- Alphabet Form 10-K for the fiscal year ended December 31, 2022.
- Auerbach, David, "Privacy Is Becoming a Premium Service," March 31, 2015, Slate, available at https://slate.com/technology/2015/03/at-t-gigapower-the-company-wants-you-to-pay-it-not-to-sell-your-data.html.
- Banton, Caroline, "Loss Leader Strategy: Definition and How It Works in Retail," Investopedia, May 27, 2021, available at https://www.investopedia.com/terms/l/lossleader.asp.
- Brodkin, Jon, "AT&T's Plan to Watch Your Web Browsing—and What You Can Do About It?," ArsTechnica, March 27, 2015, available at https://arstechnica.com/information-technology/2015/03/atts-plan-to-watch-your-web-browsing-and-what-you-can-do-about-it/.
- de Freitas, Henrique, "Conversion modeling through Consent Mode in Google Ads," Google Marketing Platform, April 15, 2021, available at https://blog.google/products/marketingplatform/360/conversion-modeling-through-consent-mode-google-ads/.
- Graham, Megan, and Jennifer Elias, "How Google's $150 billion advertising business works," CNBC, May 18, 2021, available at https://www.cnbc.com/2021/05/18/how-does-google-make-money-advertising-business-breakdown-.html.
- Hall, Gina, "AT&T to halt gathering customers' web-browsing data, stop charging for an opt-out," October 3, 2016, The Business Journals, available at https://www.bizjournals.com/bizjournals/news/2016/10/03/at-t-to-halt-gathering-customers-web-browsing-data.html.
- Kenton, Will, "What Is an Impression in Online Advertising, How to Count Them," Investopedia, January 4, 2023, available at https://www.investopedia.com/terms/i/impression.asp.
- Kierlanczyk, Kuba, "A Brief History of Market Research," Kelton, February 4, 2016, available at https://www.keltonglobal.com/perspectives/a-brief-history-of-market-research/.
- Kricheli, Ruth, "Updating our inactive account policies," Google, May 16, 2023, available at https://blog.google/technology/safety-security/updating-our-inactive-account-policies/.
- Nightingale, Ed, "Microsoft loses up to $200 on each Xbox console sold," Eurogamer, November 1, 2022, available at https://www.eurogamer.net/microsoft-loses-up-to-200-on-each-xbox-console-sold.
- Porter, Katie Sullivan, "The Power of Tracking Pixels…and How to Ensure Their Accuracy," MarinOne, September 6, 2022, available at https://www.marinsoftware.com/blog/the-power-of-tracking-pixels-and-how-to-ensure-their-accuracy.
- Sönmez, Ekin Gür, "A Complete 2023 Guide to Google App Campaigns and Their True Side," Replug, February 20, 2023, https://rplg.io/google-uac/.
- Tamplin, James, "Firebase is Joining Google!," Firebase, October 21, 2014, available at https://firebase.blog/posts/2014/10/firebase-is-joining-google.
- Wilkinson, Amy, and Nick Hubbard, "Google's Global Business Organization: Managing Innovation at Scale," 2020, available at https://www.gsb.stanford.edu/faculty-research/case-studies/googles-global-business-organization-managing-innovation-scale.

Exhibit 1A
Summary of Mr. Lasinski's Disgorgement of Profit Damages
App Promo



Notes and Sources:

[1] Lasinski Report, Figure 20.

[2] GOOG-RDGZ-00188768 at tab "Matrix"; Lasinski Report, Schedule 15.1.

[3] Lasinski Report, Figure 20; Lasinski Report, Schedule 2.2.

[4] Lasinski Report, Figure 21; Lasinski Report, Schedule 13.1; GOOG-RDGZ-00204475. Mr. Lasinski applies a monthly average, weighted by number of accounts, of the share of users with sWAA off for each year for which he calculates damages, which range from 13.87% to 69.13% and have a revenue-weighted average of 17.38%. Lasinski Report, Schedule 2.2.

[5] Lasinski Report, Figure 21; Lasinski Report, Schedule 2.2.

[6] Lasinski Report, Figure 22; Lasinski Report, Schedule 2.1; Interrogatory Response Set Six, Supplemental Response to Interrogatory No. 17, pp. 15–16. Mr. Lasinski applies an annual share of revenue attributable to conversion types bid against GA4F for each year for which he calculates damages, which range from 6.0% to 54.9% and have a revenue-weighted annual average of 30.40%.

[7] Lasinski Report, Figure 22; Lasinski Report, Schedule 2.1.

Exhibit 1B
Summary of Mr. Lasinski's Disgorgement of Profit Damages
AdMob

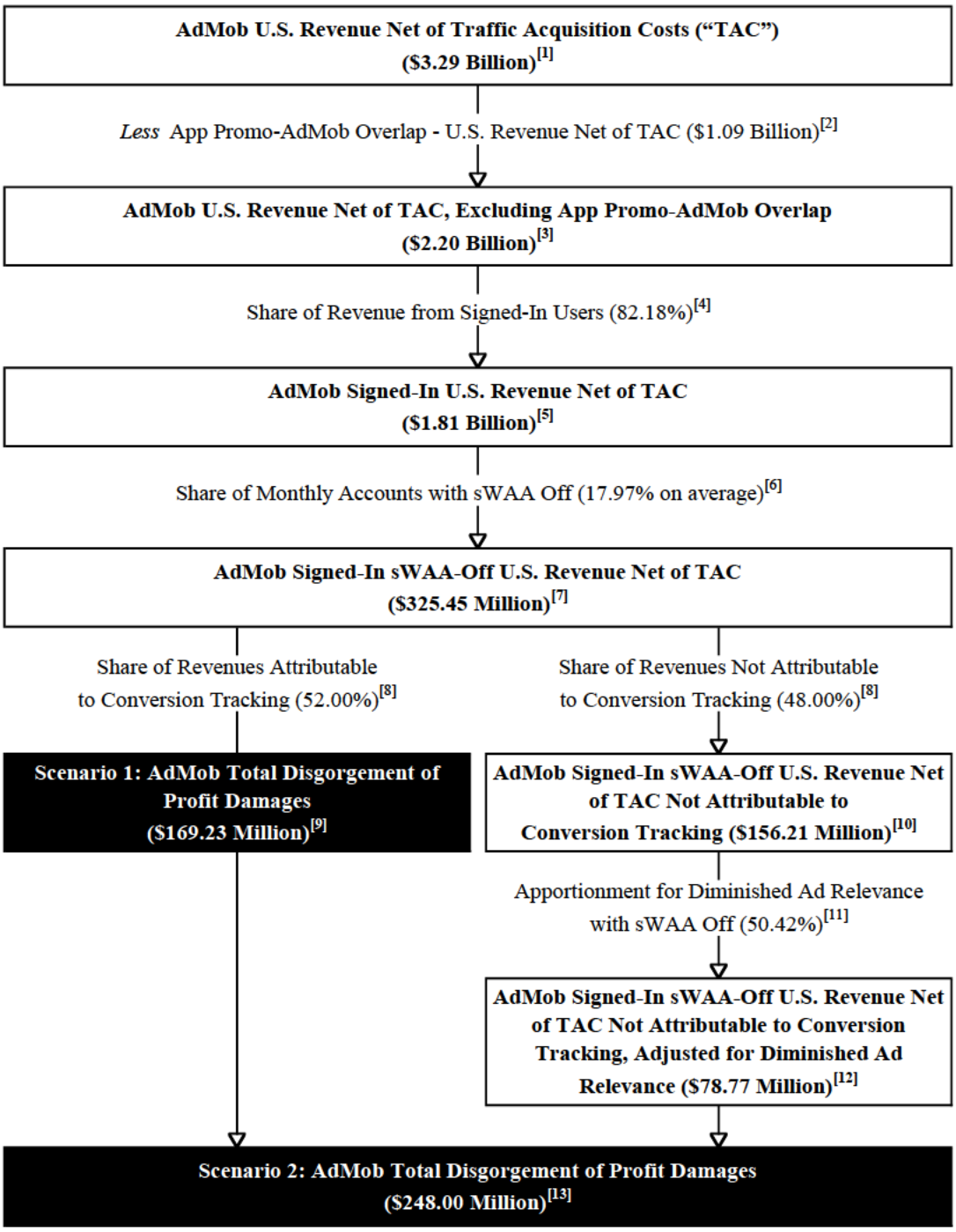


Exhibit 1B
Summary of Mr. Lasinski's Disgorgement of Profit Damages
AdMob

Notes and Sources:

[1] Lasinski Report, Figure 26; Lasinski Report, Schedule 6.1.
[2] Lasinski Report, Figure 26; Lasinski Report, Schedule 5.1.
[3] Lasinski Report, Figure 26; Lasinski Report, Schedule 3.4.
[4] GOOG-RDGZ-00188768 at tab "Matrix"; Lasinski Report, Schedule 15.1.
[5] Lasinski Report, Figure 27; Lasinski Report, Schedule 3.4.
[6] Lasinski Report, Figure 27; Lasinski Report, Schedule 13.1; GOOG-RDGZ-00204475. Mr. Lasinski applies a monthly average, weighted by number of accounts, of the share of users with sWAA off for each year for which he calculates damages, which range from 13.87% to 69.13% and have a revenue-weighted average of 17.97%. Lasinski Report, Schedule 3.4.
[7] Lasinski Report, Figure 27; Lasinski Report, Schedule 3.4.
[8] Lasinski Report, Figure 29; Lasinski Report, Schedule 3.3; GOOG-RDGZ-00188469–491 at 475.
[9] Lasinski Report, Figure 29; Lasinski Report, Schedule 3.2.
[10] Lasinski Report, Figure 36; Lasinski Report, Schedule 3.2.
[11] Lasinski Report, Figure 37; Lasinski Report, Schedule 14.1; GOOG-RDGZ-00188768 at tab "Matrix."
[12] Lasinski Report, Figure 38; Lasinski Report, Schedule 3.2.
[13] Lasinski Report, Figure 39; Lasinski Report, Schedule 3.1.

Exhibit 1C
Summary of Mr. Lasinski's Disgorgement of Profit Damages
Ad Manager

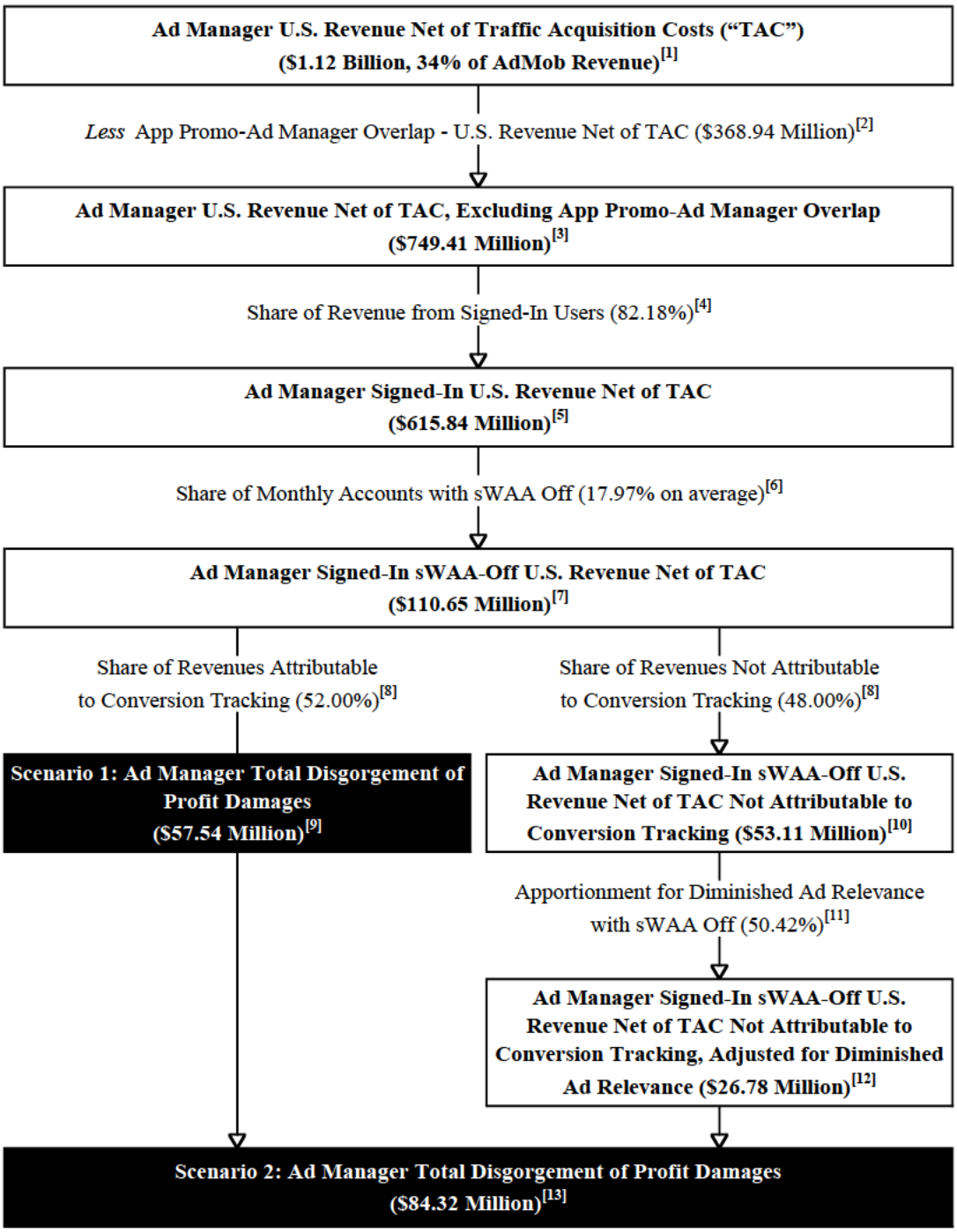


Exhibit 1C
Summary of Mr. Lasinski's Disgorgement of Profit Damages
Ad Manager

Notes and Sources:

[1] Lasinski Report, Figure 30; Lasinski Report, Schedule 5.2.
[2] Lasinski Report, Figure 31; Lasinski Report, Schedule 4.4.
[3] Lasinski Report, Figure 31; Lasinski Report, Schedule 4.4.
[4] GOOG-RDGZ-00188768 at tab "Matrix"; Lasinski Report, Schedule 15.1.
[5] Lasinski Report, Figure 32; Lasinski Report, Schedule 4.4.
[6] Lasinski Report, Figure 32; Lasinski Report, Schedule 13.1; GOOG-RDGZ-00204475. Mr. Lasinski applies a monthly average, weighted by number of accounts, of the share of users with sWAA off for each year for which he calculates damages, which range from 13.87% to 69.13% and have a revenue-weighted average of 17.97%. Lasinski Report, Schedule 4.4.
[7] Lasinski Report, Figure 32; Lasinski Report, Schedule 4.4.
[8] Lasinski Report, Figure 33; Lasinski Report, Schedule 4.3; GOOG-RDGZ-00188469–491 at 475.
[9] Lasinski Report, Figure 33; Lasinski Report, Schedule 4.3.
[10] Lasinski Report, Figure 40; Lasinski Report, Schedule 4.2.
[11] Lasinski Report, Figure 41; Lasinski Report, Schedule 14.1; GOOG-RDGZ-00188768 at tab "Matrix."
[12] Lasinski Report, Figure 41; Lasinski Report, Schedule 4.2.
[13] Lasinski Report, Figure 42; Lasinski Report, Schedule 4.1.

Exhibit 2A
App Promo Profit and Loss, 2017-2021

(Values in millions USD)

	2017	2018	2019	2020	2021
Booked Revenue[1][2]	$1,395	$2,396	$2,781	$3,764	$6,236
Traffic Acquisition Costs ("TAC")[1][2][3]	$905	$1,683	$1,921	$2,604	$4,235
Net Revenue[1][2]	**$490**	**$713**	**$860**	**$1,160**	**$2,001**
Cost of Sales[1][2][4]	**$82**	**$100**	**$108**	**$128**	**$177**
Gross Margin[1][2]	**$408**	**$614**	**$752**	**$1,032**	**$1,824**
Operating Expenses:[1][2]					
EngPM[1][2][5]	$113	$144	$179	$199	$230
GBO[1][2][6]	$108	$149	$148	$154	$224
Marketing[1][2][7]	$4	$5	$6	$7	$19
G&A[1][2][8]	$52	$67	$84	$122	$181
Technical Infrastructure[1][2][9]	$37	$42	$25	$29	$36
Total Operating Expenses[1][2]	**$314**	**$407**	**$442**	**$511**	**$690**
Operating Profit[1][2]	**$94**	**$207**	**$310**	**$521**	**$1,134**
Operating Profit as % of Net Revenue	*19.2%*	*29.0%*	*36.0%*	*44.9%*	*56.7%*

Notes and Sources:

[1] 2017-2020 values from GOOG-RDGZ-00184247.

[2] 2021 values from GOOG-RDGZ-00185744.

[3] "TAC" include Google's payments to distribution partners who offer Google's search access points and services, and to Google Network partners who display ads on their platforms. See Alphabet, Inc. Form 10-K for the fiscal year ended December 31, 2022, at p. 29; Langner Deposition, 227:7-11.

[4] "Cost of Sales" refers to Machine/Network costs, which refer to expenses associated with data centers and other operations costs (including content review and customer and product support costs), customer acquisition costs, which are payments to license content for distribution on YouTube and Google Play, as well as other costs of sales. See Alphabet, Inc. Form 10-K for the fiscal year ended December 31, 2022, at p. 29.

[5] "EngPM" refers to costs associated with engineers and product managers that work on App Promo. See Langner Deposition, 224:14-25.

[6] "GBO" represents "Global Business Operations," which I understand as costs related to Google's global operations that would be associated with App Promo. See Wilkinson, Amy, and Nick Hubbard, "Google's Global Business Organization: Managing Innovation at Scale," 2020, available at https://www.gsb.stanford.edu/faculty-research/case-studies/googles-global-business-organization-managing-innovation-scale.

[7] "Marketing" expenses primarily consist of compensation expenses for employees engaged in marketing, as well as Google's expenditure on advertising and promotional activities for App Promo. See Alphabet, Inc. Form 10-K for the fiscal year ended December 31, 2022, at p. 30.

[8] "G&A" refers to general and administrative costs including real estate functionality (REWS-GSRS), Global Affairs, Finance, People Operations, Central, and Other. See Langner Deposition, 226:4-227:1; Alphabet, Inc. Form 10-K for the fiscal year ended December 31, 2022, at p. 30; GOOG-RDGZ-00184247; GOOG-RDGZ-00185744.

[9] "Technical Infrastructure" refers to Google's "investments in servers and network equipment for computing, storage, and networking requirements for ongoing business activities." See Alphabet, Inc. Form 10-K for the fiscal year ended December 31, 2022, at p. 37.

Exhibit 2B
AdMob Profit and Loss, 2018-2021

(Values in millions USD)

	2018	2019	2020	2021
Booked Revenue[1][2]	$3,882	$4,629	$5,707	$9,012
Traffic Acquisition Costs ("TAC")[1][2][3]	$2,690	$3,178	$3,889	$6,064
Net Revenue[1][2]	**$1,192**	**$1,450**	**$1,818**	**$2,948**
Cost of Sales[1][2][4]	**$216**	**$262**	**$288**	**$392**
Gross Margin[1][2]	**$976**	**$1,188**	**$1,530**	**$2,556**
Operating Expenses:[1][2]				
EngPM[1][2][5]	$163	$230	$263	$352
GBO[1][2][6]	$213	$209	$213	$301
Marketing[1][2][7]	$8	$10	$11	$25
G&A[1][2][8]	$90	$114	$164	$261
Technical Infrastructure[1][2][9]	$54	$34	$38	$32
Total Operating Expenses[1][2]	**$527**	**$597**	**$689**	**$970**
Operating Profit[1][2]	**$449**	**$590**	**$841**	**$1,586**
Operating Profit as % of Net Revenue	*37.7%*	*40.7%*	*46.3%*	*53.8%*

Notes and Sources:

[1] 2018-2020 values from GOOG-RDGZ-00187666.

[2] 2021 values from GOOG-RDGZ-00187665.

[3] "TAC" include Google's payments to distribution partners who offer Google's search access points and services, and to Google Network partners who display ads on their platforms. See Alphabet, Inc. Form 10-K for the fiscal year ended December 31, 2022, at p. 29; Langner Deposition, 227:7-11.

[4] "Cost of Sales" refers to Machine/Network costs, which refer to expenses associated with data centers and other operations costs (including content review and customer and product support costs), customer acquisition costs, which are payments to license content for distribution on YouTube and Google Play, as well as other costs of sales. See Alphabet, Inc. Form 10-K for the fiscal year ended December 31, 2022, at p. 29.

[5] "EngPM" refers to costs associated with engineers and product managers that work on AdMob. See Langner Deposition, 224:14-25.

[6] "GBO" represents "Global Business Operations," which I understand as costs related to Google's global operations that would be associated with AdMob. See Wilkinson, Amy, and Nick Hubbard, "Google's Global Business Organization: Managing Innovation at Scale," 2020, available at https://www.gsb.stanford.edu/faculty-research/case-studies/googles-global-business-organization-managing-innovation-scale.

[7] "Marketing" expenses primarily consist of compensation expenses for employees engaged in marketing, as well as Google's expenditure on advertising and promotional activities for AdMob. See Alphabet, Inc. Form 10-K for the fiscal year ended December 31, 2022, at p. 30.

[8] "G&A" refers to general and administrative costs including real estate functionality (REWS-GSRS), Global Affairs, Finance, People Operations, Central, and Other. See Langner Deposition, 226:4-227:1; Alphabet, Inc. Form 10-K for the fiscal year ended December 31, 2022, at p. 30; GOOG-RDGZ-00187665; GOOG-RDGZ-00187666.

[9] "Technical Infrastructure" refers to Google's "investments in servers and network equipment for computing, storage, and networking requirements for ongoing business activities." See Alphabet, Inc. Form 10-K for the fiscal year ended December 31, 2022, at p. 37.

Exhibit 3
Monthly Share of Accounts with sWAA Off and sWAA Opt-Out Rate for Google Display Advertising Impressions and Clicks
March 2022–May 2022

Month	Share of Accounts with sWAA Off (Lasinski Report)[1] [A]	sWAA Opt-Out Rate on Google Display Advertising Stack Impressions[2] [B]	sWAA Opt-Out Rate on Google Display Advertising Stack Clicks[2] [C]	Google Display Impressions Opt-Out Rate as a Percentage of sWAA-Off Share of Accounts [D] = [B] / [A]	Google Display Clicks Opt-Out Rate as a Percentage of sWAA-Off Share of Accounts [E] = [C] / [A]
March 2022	13.94%	9.45%	6.16%	67.79%	44.19%
April 2022	13.92%	9.52%	6.08%	68.41%	43.69%
May 2022	13.94%	9.39%	6.52%	67.37%	46.78%
Average[3]	**13.93%**	**9.45%**	**6.25%**	**67.86%**	**44.89%**

Notes and Sources:
[1] Lasinski Report, Schedule 13.2.
[2] Interrogatory Response Set Six, Second Supplemental Response to Interrogatory No. 17, pp. 21–24.
[3] This row contains a simple average of the data for March 2022 through May 2022 in the rows above.

Exhibit 4A
App Promo Scenarios 1 and 2 Disgorgement of Profit Damages Adjusted for sWAA-Off Share of Impressions and Clicks

Panel A: Share of Impressions

	Jul. - Dec. 2016	2017	2018	2019	2020	2021	2022	Total
App Promo Signed-In sWAA-Off U S Revenue Net of Traffic Acquisition Costs [1]	$77,321,623	$134,017,322	$124,204,189	$127,276,139	$134,320,786	$234,244,169	$260,819,220	$1,092,203,448
Google Display Impressions Opt-Out Rate as a Percentage of sWAA-Off Share of Accounts [2]	67 9%	67 9%	67 9%	67 9%	67 9%	67 9%	67 9%	
App Promo U S Revenue Net of TAC Adjusted for sWAA-Off Share of Impressions [3]	$52,466,692	$90,937,636	$84,278,921	$86,363,397	$91,143,551	$158,946,699	$176,979,236	$741,116,132
Share of Revenue Attributable to Conversion Types Bid Against GA4F [4]	6 0%	6 0%	6 0%	10 6%	29 4%	49 4%	54 9%	
App Promo Total Disgorgement of Profit Damages Adjusted for sWAA-Off Share of Impressions - Scenarios 1 and 2 [5]	**$3,148,002**	**$5,456,258**	**$5,056,735**	**$9,154,520**	**$26,796,204**	**$78,519,669**	**$97,161,600**	**$225,292,989**

Panel B: Share of Clicks

	Jul. - Dec. 2016	2017	2018	2019	2020	2021	2022	Total
App Promo Signed-In sWAA-Off U S Revenue Net of Traffic Acquisition Costs [1]	$77,321,623	$134,017,322	$124,204,189	$127,276,139	$134,320,786	$234,244,169	$260,819,220	$1,092,203,448
Google Display Clicks Opt-Out Rate as a Percentage of sWAA-Off Share of Accounts [2]	44 9%	44 9%	44 9%	44 9%	44 9%	44 9%	44 9%	
App Promo U S Revenue Net of TAC Adjusted for sWAA-Off Share of Clicks [3]	$34,705,854	$60,153,751	$55,749,121	$57,127,968	$60,289,961	$105,140,629	$117,068,855	$490,236,139
Share of Revenue Attributable to Conversion Types Bid Against GA4F [4]	6 0%	6 0%	6 0%	10 6%	29 4%	49 4%	54 9%	
App Promo Total Disgorgement of Profit Damages Adjusted for sWAA-Off Share of Clicks - Scenarios 1 and 2 [5]	**$2,082,351**	**$3,609,225**	**$3,344,947**	**$6,055,565**	**$17,725,249**	**$51,939,471**	**$64,270,802**	**$149,027,609**

Notes and Sources:
[1] Lasinski Report, Schedule 2 2
[2] Exhibit 3 These shares are simple averages based on available data for the months of March 2022 through May 2022
[3] To calculate App Promo U S Revenue Net of TAC Adjusted for sWAA-Off Share of Impressions/Clicks, App Promo Signed-In sWAA-Off U S Revenue Net of Traffic Acquisition Costs, as calculated by Mr Lasinski, is multiplied by the average Google Display Impressions/Clicks Opt-Out Rate as a Percentage of sWAA-Off Accounts Share calculated in Exhibit 3
[4] Lasinski Report, Schedule 2 1
[5] To calculate App Promo Total Disgorgement of Profit Damages Adjusted for sWAA-Off Share of Impressions/Clicks - Scenarios 1 and 2, App Promo U S Revenue Net of TAC Adjusted for sWAA-Off Share of Impressions/Clicks, respectively, are multiplied by the Share of Revenue Attributable to Conversion Types Bid Against GA4F, consistent with the method Mr Lasinski applies in his Schedule 2 1

Exhibit 4B
AdMob Scenarios 1 and 2 Disgorgement of Profit Damages Adjusted for sWAA-Off Share of Impressions and Clicks

Panel A: Share of Impressions

	Jul. - Dec. 2016	2017	2018	2019	2020	2021	2022	Total
AdMob Signed-In sWAA-Off U S Revenue Net of TAC (Excluding App Promo-AdMob Overlap) [1]	$26,199,568	$45,410,272	$42,085,201	$43,645,561	$40,055,279	$60,587,853	$67,461,557	$325,445,289
Google Display Impressions Opt-Out Rate as a Percentage of sWAA-Off Share of Accounts [2]	67 9%	67 9%	67 9%	67 9%	67 9%	67 9%	67 9%	
AdMob U S Revenue Net of TAC (Excluding App Promo-AdMob Overlap) Adjusted for sWAA-Off Share of Impressions [3]	$17,777,752	$30,813,201	$28,556,970	$29,615,754	$27,179,564	$41,111,970	$45,776,131	$220,831,343
Share of Revenues Attributable to Conversion Tracking [4]	52 0%	52 0%	52 0%	52 0%	52 0%	52 0%	52 0%	
AdMob Disgorgement of Profit Damages Adjusted for sWAA-Off Share of Impressions - Scenario 1 [5]	**$9,244,431**	**$16,022,865**	**$14,849,625**	**$15,400,192**	**$14,133,373**	**$21,378,224**	**$23,803,588**	**$114,832,298**
AdMob Signed-In U S Revenue Net of TAC (Excluding App Promo-AdMob Overlap) Not Attributable to Conversion Tracking Adjusted for sWAA-Off Share of Impressions [6]	$8,533,321	$14,790,337	$13,707,346	$14,215,562	$13,046,191	$19,733,745	$21,972,543	$105,999,044
Apportionment for Diminished Ad Relevance with sWAA Off [7]	50 4%	50 4%	50 4%	50 4%	50 4%	50 4%	50 4%	
AdMob Signed-In U S Revenue Net of TAC (Excluding App Promo-AdMob Overlap) Not Attributable to Conversion Tracking and Adjusted for Diminished Ad Relevance with sWAA Off and sWAA-Off Share of Impressions [8]	$4,302,717	$7,457,663	$6,911,591	$7,167,847	$6,578,220	$9,950,255	$11,079,113	$53,447,406
AdMob Disgorgement of Profit Damages Adjusted for sWAA-Off Share of Impressions - Scenario 2 [9]	**$13,547,148**	**$23,480,527**	**$21,761,216**	**$22,568,039**	**$20,711,593**	**$31,328,479**	**$34,882,701**	**$168,279,704**

Panel B: Share of Clicks

	Jul. - Dec. 2016	2017	2018	2019	2020	2021	2022	Total
AdMob Signed-In sWAA-Off U S Revenue Net of TAC (Excluding App Promo-AdMob Overlap) [1]	$26,199,568	$45,410,272	$42,085,201	$43,645,561	$40,055,279	$60,587,853	$67,461,557	$325,445,289
Google Display Clicks Opt-Out Rate as a Percentage of sWAA-Off Share of Accounts [2]	44 9%	44 9%	44 9%	44 9%	44 9%	44 9%	44 9%	
AdMob U S Revenue Net of TAC (Excluding App Promo-AdMob Overlap) Adjusted for sWAA-Off Share of Clicks [3]	$11,759,691	$20,382,426	$18,889,966	$19,590,335	$17,978,835	$27,194,892	$30,280,158	$146,076,303
Share of Revenues Attributable to Conversion Tracking [4]	52 0%	52 0%	52 0%	52 0%	52 0%	52 0%	52 0%	
AdMob Disgorgement of Profit Damages Adjusted for sWAA-Off Share of Clicks - Scenario 1 [5]	**$6,115,039**	**$10,598,862**	**$9,822,783**	**$10,186,974**	**$9,348,994**	**$14,141,344**	**$15,745,682**	**$75,959,678**
AdMob Signed-In U S Revenue Net of TAC (Excluding App Promo-AdMob Overlap) Not Attributable to Conversion Tracking Adjusted for sWAA-Off Share of Clicks [6]	$5,644,652	$9,783,565	$9,067,184	$9,403,361	$8,629,841	$13,053,548	$14,534,476	$70,116,626
Apportionment for Diminished Ad Relevance with sWAA Off [7]	50 4%	50 4%	50 4%	50 4%	50 4%	50 4%	50 4%	
AdMob Signed-In U S Revenue Net of TAC (Excluding App Promo-AdMob Overlap) Not Attributable to Conversion Tracking and Adjusted for Diminished Ad Relevance with sWAA Off and sWAA-Off Share of Clicks [8]	$2,846,176	$4,933,121	$4,571,904	$4,741,413	$4,351,384	$6,581,930	$7,328,651	$35,354,580
AdMob Disgorgement of Profit Damages Adjusted for sWAA-Off Share of Clicks - Scenario 2 [9]	**$8,961,216**	**$15,531,983**	**$14,394,687**	**$14,928,387**	**$13,700,378**	**$20,723,274**	**$23,074,334**	**$111,314,258**

Exhibit 4B
AdMob Scenarios 1 and 2 Disgorgement of Profit Damages Adjusted for sWAA-Off Share of Impressions and Clicks

Notes and Sources:

[1] Lasinski Report, Schedule 3 4

[2] Exhibit 3 These shares are simple averages based on available data for the months of March 2022 through May 2022

[3] To calculate AdMob U S Revenue Net of TAC (Excluding App Promo-AdMob Overlap) Adjusted for sWAA-Off Share of Impressions/Clicks, AdMob Signed-In sWAA-Off U S Revenue Net of TAC (Excluding App Promo-AdMob Overlap), as calculated by Mr Lasinski, is multiplied by the average Google Display Impressions/Clicks Opt-Out Rate as a Percentage of sWAA-Off Accounts Share calculated in Exhibit 3

[4] Lasinski Report, Schedule 3 3; GOOG-RDGZ-00188469, at 475 This figure is drawn from an internal Google document on ChromeGuard's impact to Display Ads and is equal to the "conversion-based autobidding proportion" of revenue

[5] To calculate AdMob Disgorgement of Profit Damages Adjusted for sWAA-Off Share of Impressions/Clicks - Scenario 1, AdMob U S Revenue Net of TAC (Excluding App Promo-AdMob Overlap) Adjusted for sWAA-Off Share of Impressions/Clicks, respectively, is multiplied by the Share of Revenues Attributable to Conversion Tracking, consistent with the method Mr Lasinski applies in his Schedule 3 3

[6] To calculate AdMob Signed-In U S Revenue Net of TAC (Excluding App Promo-AdMob Overlap) Not Attributable to Conversion Tracking Adjusted for sWAA-Off Share of Impressions/Clicks, AdMob Disgorgement of Profit Damages Adjusted for sWAA-Off Share of Impressions/Clicks - Scenario 1, respectively, as calculated above, is subtracted from AdMob U S Revenue Net of TAC (Excluding App Promo-AdMob Overlap) Adjusted for sWAA-Off Share of Impressions/Clicks, respectively

[7] Lasinski Report, Schedule 3 2

[8] To calculate AdMob Signed-In U S Revenue Net of TAC (Excluding App Promo-AdMob Overlap) Not Attributable to Conversion Tracking and Adjusted for Diminished Ad Relevance with sWAA Off and sWAA-Off Share of Impressions/Clicks, AdMob Signed-In U S Revenue Net of TAC (Excluding App Promo-AdMob Overlap) Not Attributable to Conversion Tracking Adjusted for sWAA-Off Share of Impressions/Clicks, respectively, as calculated above, is multiplied by the Apportionment for Diminished Ad Relevance with sWAA Off, consistent with the method Mr Lasinski applies in his Schedule 3 2

[9] To calculate AdMob Disgorgement of Profit Damages Adjusted for sWAA-Off Share of Impressions/Clicks - Scenario 2, AdMob Disgorgement of Profit Damages Adjusted for sWAA-Off Share of Impressions/Clicks - Scenario 1, respectively, is added to AdMob Signed-In U S Revenue Net of TAC (Excluding App Promo-AdMob Overlap) Not Attributable to Conversion Tracking and Adjusted for Diminished Ad Relevance with sWAA Off and sWAA-Off Share of Impressions/Clicks, respectively, both of which are calculated above, consistent with the method Mr Lasinski applies in his Schedule 3 1

Exhibit 4C
Ad Manager Scenarios 1 and 2 Disgorgement of Profit Damages Adjusted for sWAA-Off Share of Impressions and Clicks

Panel A: Share of Impressions

	Jul. - Dec. 2016	2017	2018	2019	2020	2021	2022	Total
Ad Manager Signed-In sWAA-Off U S Revenue Net of TAC (Excluding App Promo-Ad Manager Overlap) [1]	$8,907,853	$15,439,492	$14,308,968	$14,839,491	$13,618,795	$20,599,870	$22,936,929	$110,651,398
Google Display Impressions Opt-Out Rate as a Percentage of sWAA-Off Share of Accounts [2]	67 9%	67 9%	67 9%	67 9%	67 9%	67 9%	67 9%	
Ad Manager U S Revenue Net of TAC (Excluding App Promo-Ad Manager Overlap) Adjusted for sWAA-Off Share of Impressions [3]	$6,044,436	$10,476,488	$9,709,370	$10,069,356	$9,241,052	$13,978,070	$15,563,885	$75,082,656
Share of Revenues Attributable to Conversion Tracking [4]	52 0%	52 0%	52 0%	52 0%	52 0%	52 0%	52 0%	
Ad Manager Disgorgement of Profit Damages Adjusted for sWAA-Off Share of Impressions - Scenario 1 [5]	**$3,143,107**	**$5,447,774**	**$5,048,872**	**$5,236,065**	**$4,805,347**	**$7,268,596**	**$8,093,220**	**$39,042,981**
Ad Manager Signed-In U S Revenue Net of TAC (Excluding App Promo-Ad Manager Overlap) Not Attributable to Conversion Tracking Adjusted for sWAA-Off Share of Impressions [6]	$2,901,329	$5,028,714	$4,660,498	$4,833,291	$4,435,705	$6,709,473	$7,470,665	$36,039,675
Apportionment for Diminished Ad Relevance with sWAA Off [7]	50 4%	50 4%	50 4%	50 4%	50 4%	50 4%	50 4%	
Ad Manager Signed-In U S Revenue Net of TAC (Excluding App Promo-Ad Manager Overlap) Not Attributable to Conversion Tracking and Adjusted for Diminished Ad Relevance with sWAA Off and sWAA-Off Share of Impressions [8]	$1,462,924	$2,535,605	$2,349,941	$2,437,068	$2,236,595	$3,383,087	$3,766,898	$18,172,118
Ad Manager Disgorgement of Profit Damages Adjusted for sWAA-Off Share of Impressions - Scenario 2 [9]	**$4,606,030**	**$7,983,379**	**$7,398,813**	**$7,673,133**	**$7,041,942**	**$10,651,683**	**$11,860,118**	**$57,215,099**

Panel B: Share of Clicks

	Jul. - Dec. 2016	2017	2018	2019	2020	2021	2022	Total
Ad Manager Signed-In sWAA-Off U S Revenue Net of TAC (Excluding App Promo-Ad Manager Overlap) [1]	$8,907,853	$15,439,492	$14,308,968	$14,839,491	$13,618,795	$20,599,870	$22,936,929	$110,651,398
Google Display Clicks Opt-Out Rate as a Percentage of sWAA-Off Share of Accounts [2]	44 9%	44 9%	44 9%	44 9%	44 9%	44 9%	44 9%	
Ad Manager U S Revenue Net of TAC (Excluding App Promo-Ad Manager Overlap) Adjusted for sWAA-Off Share of Clicks [3]	$3,998,295	$6,930,025	$6,422,589	$6,660,714	$6,112,804	$9,246,263	$10,295,254	$49,665,943
Share of Revenues Attributable to Conversion Tracking [4]	52 0%	52 0%	52 0%	52 0%	52 0%	52 0%	52 0%	
Ad Manager Disgorgement of Profit Damages Adjusted for sWAA-Off Share of Clicks - Scenario 1 [5]	**$2,079,113**	**$3,603,613**	**$3,339,746**	**$3,463,571**	**$3,178,658**	**$4,808,057**	**$5,353,532**	**$25,826,290**
Ad Manager Signed-In U S Revenue Net of TAC (Excluding App Promo-Ad Manager Overlap) Not Attributable to Conversion Tracking Adjusted for sWAA-Off Share of Clicks [6]	$1,919,182	$3,326,412	$3,082,843	$3,197,143	$2,934,146	$4,438,206	$4,941,722	$23,839,653
Apportionment for Diminished Ad Relevance with sWAA Off [7]	50 4%	50 4%	50 4%	50 4%	50 4%	50 4%	50 4%	
Ad Manager Signed-In U S Revenue Net of TAC (Excluding App Promo-Ad Manager Overlap) Not Attributable to Conversion Tracking and Adjusted for Diminished Ad Relevance with sWAA Off and sWAA-Off Share of Clicks [8]	$967,700	$1,677,261	$1,554,447	$1,612,080	$1,479,471	$2,237,856	$2,491,741	$12,020,557
Ad Manager Disgorgement of Profit Damages Adjusted for sWAA-Off Share of Clicks - Scenario 2 [9]	**$3,046,813**	**$5,280,874**	**$4,894,193**	**$5,075,652**	**$4,658,129**	**$7,045,913**	**$7,845,273**	**$37,846,848**

Exhibit 4C
Ad Manager Scenarios 1 and 2 Disgorgement of Profit Damages Adjusted for sWAA-Off Share of Impressions and Clicks

Notes and Sources:

[1] Lasinski Report, Schedule 4 4

[2] Exhibit 3 These shares are simple averages based on available data for the months of March 2022 through May 2022

[3] To calculate Ad Manager U S Revenue Net of TAC (Excluding App Promo-Ad Manager Overlap) Adjusted for sWAA-Off Share of Impressions/Clicks, Ad Manager Signed-In sWAA-Off U S Revenue Net of TAC (Excluding App Promo-Ad Manager Overlap), as calculated by Mr Lasinski, is multiplied by the average Google Display Impressions/Clicks Opt-Out Rate as a Percentage of sWAA-Off Accounts Share calculated in Exhibit 3

[4] Lasinski Report, Schedule 4 3; GOOG-RDGZ-00188469, at 475 This figure is drawn from an internal Google document on ChromeGuard's impact to Display Ads and is equal to the "conversion-based autobidding proportion" of revenue

[5] To calculate Ad Manager Disgorgement of Profit Damages Adjusted for sWAA-Off Share of Impressions/Clicks - Scenario 1, Ad Manager U S Revenue Net of TAC (Excluding App Promo-Ad Manager Overlap) Adjusted for sWAA-Off Share of Impressions/Clicks, respectively, is multiplied by the Share of Revenues Attributable to Conversion Tracking, consistent with the method Mr Lasinski applies in his Schedule 4 3

[6] To calculate Ad Manager Signed-In U S Revenue Net of TAC (Excluding App Promo-Ad Manager Overlap) Not Attributable to Conversion Tracking Adjusted for sWAA-Off Share of Impressions/Clicks, Ad Manager Disgorgement of Profit Damages Adjusted for sWAA-Off Share of Impressions/Clicks - Scenario 1, respectively, as calculated above, is subtracted from Ad Manager U S Revenue Net of TAC (Excluding App Promo-Ad Manager Overlap) Adjusted for sWAA-Off Share of Impressions/Clicks, respectively

[7] Lasinski Report, Schedule 4 2

[8] To calculate Ad Manager Signed-In U S Revenue Net of TAC (Excluding App Promo-Ad Manager Overlap) Not Attributable to Conversion Tracking and Adjusted for Diminished Ad Relevance with sWAA Off and sWAA-Off Share of Impressions/Clicks, Ad Manager Signed-In U S Revenue Net of TAC (Excluding App Promo-Ad Manager Overlap) Not Attributable to Conversion Tracking Adjusted for sWAA-Off Share of Impressions/Clicks, respectively, as calculated above, is multiplied by the Apportionment for Diminished Ad Relevance with sWAA Off, consistent with the method Mr Lasinski applies in his Schedule 4 2

[9] To calculate Ad Manager Disgorgement of Profit Damages Adjusted for sWAA-Off Share of Impressions/Clicks - Scenario 2, Ad Manager Disgorgement of Profit Damages Adjusted for sWAA-Off Share of Impressions/Clicks - Scenario 1, respectively, is added to Ad Manager Signed-In U S Revenue Net of TAC (Excluding App Promo-Ad Manager Overlap) Not Attributable to Conversion Tracking and Adjusted for Diminished Ad Relevance with sWAA Off and sWAA-Off Share of Impressions/Clicks, respectively, both of which are calculated above, consistent with the method Mr Lasinski applies in his Schedule 4 1

Exhibit 4D
Comparison of Lasinski and sWAA-Off Share-Adjusted Scenario 1 Disgorgement of Profit Damages

Panel A: Share of Accounts (Lasinski Method)

	Jul. - Dec. 2016	2017	2018	2019	2020	2021	2022	Total
App Promo [1]	$4,639,297	$8,041,039	$7,452,251	$13,491,271	$39,490,311	$115,716,620	$143,189,752	$332,020,541
AdMob [1]	$13,623,775	$23,613,341	$21,884,305	$22,695,692	$20,828,745	$31,505,683	$35,080,010	$169,231,550
Ad Manager [1]	$4,632,084	$8,028,536	$7,440,664	$7,716,535	$7,081,773	$10,711,932	$11,927,203	$57,538,727
Total	**$22,895,156**	**$39,682,917**	**$36,777,219**	**$43,903,497**	**$67,400,829**	**$157,934,235**	**$190,196,965**	**$558,790,819**

Panel B: Share of Impressions

	Jul. - Dec. 2016	2017	2018	2019	2020	2021	2022	Total
App Promo [2]	$3,148,002	$5,456,258	$5,056,735	$9,154,520	$26,796,204	$78,519,669	$97,161,600	$225,292,989
AdMob [3]	$9,244,431	$16,022,865	$14,849,625	$15,400,192	$14,133,373	$21,378,224	$23,803,588	$114,832,298
Ad Manager [4]	$3,143,107	$5,447,774	$5,048,872	$5,236,065	$4,805,347	$7,268,596	$8,093,220	$39,042,981
Total	**$15,535,539**	**$26,926,897**	**$24,955,232**	**$29,790,778**	**$45,734,924**	**$107,166,490**	**$129,058,409**	**$379,168,268**
% Reduction from Lasinski Method = -32.1%								

Panel C: Share of Clicks

	Jul. - Dec. 2016	2017	2018	2019	2020	2021	2022	Total
App Promo [2]	$2,082,351	$3,609,225	$3,344,947	$6,055,565	$17,725,249	$51,939,471	$64,270,802	$149,027,609
AdMob [3]	$6,115,039	$10,598,862	$9,822,783	$10,186,974	$9,348,994	$14,141,344	$15,745,682	$75,959,678
Ad Manager [4]	$2,079,113	$3,603,613	$3,339,746	$3,463,571	$3,178,658	$4,808,057	$5,353,532	$25,826,290
Total	**$10,276,504**	**$17,811,700**	**$16,507,476**	**$19,706,110**	**$30,252,900**	**$70,888,871**	**$85,370,016**	**$250,813,577**
% Reduction from Lasinski Method = -55.1%								

Sources:
[1] Lasinski Report, Schedule 1.3.
[2] Exhibit 4A.
[3] Exhibit 4B.
[4] Exhibit 4C.

Exhibit 4E
Comparison of Lasinski and sWAA-Off Share-Adjusted Scenario 2 Disgorgement of Profit Damages

Panel A: Share of Accounts (Lasinski Method)

	Jul. - Dec. 2016	2017	2018	2019	2020	2021	2022	Total
App Promo [1]	$4,639,297	$8,041,039	$7,452,251	$13,491,271	$39,490,311	$115,716,620	$143,189,752	$332,020,541
AdMob [1]	$19,964,809	$34,603,906	$32,070,109	$33,259,147	$30,523,251	$46,169,650	$51,407,607	$247,998,478
Ad Manager [1]	$6,788,035	$11,765,328	$10,903,837	$11,308,110	$10,377,905	$15,697,681	$17,478,586	$84,319,482
Total	**$31,392,141**	**$54,410,273**	**$50,426,197**	**$58,058,527**	**$80,391,467**	**$177,583,951**	**$212,075,945**	**$664,338,502**

Panel B: Share of Impressions

	Jul. - Dec. 2016	2017	2018	2019	2020	2021	2022	Total
App Promo [2]	$3,148,002	$5,456,258	$5,056,735	$9,154,520	$26,796,204	$78,519,669	$97,161,600	$225,292,989
AdMob [3]	$13,547,148	$23,480,527	$21,761,216	$22,568,039	$20,711,593	$31,328,479	$34,882,701	$168,279,704
Ad Manager [4]	$4,606,030	$7,983,379	$7,398,813	$7,673,133	$7,041,942	$10,651,683	$11,860,118	$57,215,099
Total	**$21,301,180**	**$36,920,165**	**$34,216,764**	**$39,395,692**	**$54,549,739**	**$120,499,831**	**$143,904,420**	**$450,787,792**
% Reduction from Lasinski Method = -32.1%								

Panel C: Share of Clicks

	Jul. - Dec. 2016	2017	2018	2019	2020	2021	2022	Total
App Promo [2]	$2,082,351	$3,609,225	$3,344,947	$6,055,565	$17,725,249	$51,939,471	$64,270,802	$149,027,609
AdMob [3]	$8,961,216	$15,531,983	$14,394,687	$14,928,387	$13,700,378	$20,723,274	$23,074,334	$111,314,258
Ad Manager [4]	$3,046,813	$5,280,874	$4,894,193	$5,075,652	$4,658,129	$7,045,913	$7,845,273	$37,846,848
Total	**$14,090,380**	**$24,422,082**	**$22,633,827**	**$26,059,603**	**$36,083,756**	**$79,708,657**	**$95,190,409**	**$298,188,714**
% Reduction from Lasinski Method = -55.1%								

Sources:
[1] Lasinski Report, Schedule 1.4.
[2] Exhibit 4A.
[3] Exhibit 4B.
[4] Exhibit 4C.

Exhibit 5A
App Promo Scenarios 1 and 2 Disgorgement of Profit Damages Using Operating Profit

	Jul. - Dec. 2016	2017	2018	2019	2020	2021	2022	Total
App Promo U S Revenue Net of Traffic Acquisition Costs [1]	$136,111,111	$490,000,000	$713,000,000	$860,000,000	$1,159,900,000	$2,001,000,000	$2,288,957,643	$7,648,968,754
Operating Profit Margin (as Percentage of Revenue Net of TAC) [2]	19 2%	19 2%	29 0%	36 0%	44 9%	56 7%	56 7%	
App Promo U S Operating Profit [3]	$26,111,111	$94,000,000	$207,000,000	$310,000,000	$521,000,000	$1,134,000,000	$1,297,190,388	$3,589,301,499
Share of Revenue from Signed-In Users [1]	82 2%	82 2%	82 2%	82 2%	82 2%	82 2%	82 2%	
App Promo Signed-In U S Operating Profit [4]	$21,457,047	$77,245,370	$170,104,167	$254,745,370	$428,136,574	$931,875,000	$1,065,978,212	$2,949,541,741
Share of Monthly Accounts with sWAA Off [1]	69 1%	33 3%	21 2%	18 0%	14 1%	14 2%	13 9%	
App Promo Signed-In sWAA-Off U S Operating Profit [5]	$14,833,128	$25,709,445	$36,059,281	$45,878,608	$60,333,761	$132,750,069	$147,810,593	$463,374,885
Share of Revenue Attributable to Conversion Types Bid Against GA4F [6]	6 0%	6 0%	6 0%	10 6%	29 4%	49 4%	54 9%	
App Promo Total Disgorgement of Profit Damages Using Operating Profit - Scenarios 1 and 2 [7]	**$889,988**	**$1,542,567**	**$2,163,557**	**$4,863,132**	**$17,738,126**	**$65,578,534**	**$81,148,015**	**$173,923,919**

Notes and Sources:
[1] Lasinski Report, Schedule 2 2
[2] Exhibit 2A The 2017 Operating Profit Margin (as Percentage of Revenue Net of TAC) is used for Jul - Dec 2016, and the 2021 Operating Profit Margin (as Percentage of Revenue Net of TAC) is used for 2022
[3] To estimate App Promo U S Operating Profit, App Promo U S Revenue Net of Traffic Acquisition Costs, as calculated by Mr Lasinski, is multiplied by Operating Profit Margin (as Percentage of Revenue Net of TAC), as calculated in Exhibit 2A
[4] App Promo Signed-In U S Operating Profit is calculated by multiplying App Promo U S Operating Profit by the Share of Revenue from Signed-In Users, consistent with the method Mr Lasinski applies in his Schedule 2 2
[5] App Promo Signed-In sWAA-Off U S Operating Profit is calculated by multiplying App Promo Signed-In U S Operating Profit by the Share of Monthly Accounts with sWAA Off, consistent with the method Mr Lasinski applies in his Schedule 2 2
[6] Lasinski Report, Schedule 2 1
[7] To calculate App Promo Total Disgorgement of Profit Damages Using Operating Profit - Scenarios 1 and 2, App Promo Signed-In sWAA-Off U S Operating Profit is multiplied by the Share of Revenue Attributable to Conversion Types Bid Against GA4F, consistent with the method Mr Lasinski applies in his Schedule 2 1

Exhibit 5B
AdMob Scenarios 1 and 2 Disgorgement of Profit Damages Using Operating Profit

	Jul. - Dec. 2016	2017	2018	2019	2020	2021	2022	Total
AdMob U S Revenue Net of TAC (Excluding App Promo-AdMob Overlap) [1]	$46,119,729	$166,031,023	$241,592,080	$294,911,382	$345,889,263	$517,563,759	$592,044,739	$2,204,151,975
AdMob Global Operating Profit Margin (as Percentage of Revenue Net of TAC) [2]	37 7%	37 7%	37 7%	40 7%	46 3%	53 8%	53 8%	
AdMob U S Operating Profit (Excluding App Promo-AdMob Overlap) [3]	$17,372,280	$62,540,209	$91,002,386	$119,998,424	$160,007,079	$278,445,089	$318,515,250	$1,047,880,717
Share of Revenue from Signed-In Users [1]	82 2%	82 2%	82 2%	82 2%	82 2%	82 2%	82 2%	
AdMob Signed-In U S Operating Profit (Excluding App Promo-AdMob Overlap) [4]	$14,275,832	$51,392,996	$74,782,053	$98,609,816	$131,487,299	$228,814,830	$261,742,856	$861,105,682
Share of Monthly Accounts with sWAA Off [1]	69 1%	33 3%	21 2%	18 0%	14 1%	14 2%	13 9%	
AdMob Signed-In sWAA-Off U S Operating Profit (Excluding App Promo-AdMob Overlap) [5]	$9,868,797	$17,105,044	$15,852,563	$17,759,228	$18,529,422	$32,595,771	$36,293,769	$148,004,594
Share of Revenue Attributable to Conversion Types Bid Against GA4F [6]	52 0%	52 0%	52 0%	52 0%	52 0%	52 0%	52 0%	
AdMob Total Disgorgement of Profit Damages Using Operating Profit - Scenario 1 [7]	**$5,131,774**	**$8,894,623**	**$8,243,333**	**$9,234,799**	**$9,635,299**	**$16,949,801**	**$18,872,760**	**$76,962,389**
AdMob Signed-In sWAA-Off U S Operating Profit (Excluding App Promo-AdMob Overlap) Not Attributable to Conversion Tracking [8]	$4,737,022	$8,210,421	$7,609,230	$8,524,429	$8,894,123	$15,645,970	$17,421,009	$71,042,205
Apportionment for Diminished Ad Relevance with sWAA Off [9]	50 4%	50 4%	50 4%	50 4%	50 4%	50 4%	50 4%	
AdMob Signed-In sWAA-Off U S Operating Profit (Excluding App Promo-AdMob Overlap) Not Attributable to Conversion Tracking and Adjusted for Diminished Ad Relevance [10]	$2,388,527	$4,139,902	$3,836,767	$4,298,233	$4,484,642	$7,889,095	$8,784,114	$35,821,281
AdMob Total Disgorgement of Profit Damages Using Operating Profit - Scenario 2 [11]	**$7,520,301**	**$13,034,525**	**$12,080,100**	**$13,533,032**	**$14,119,942**	**$24,838,896**	**$27,656,874**	**$112,783,670**

Notes and Sources:
[1] Lasinski Report, Schedule 3 4
[2] Exhibit 2B The 2018 Global Operating Profit Margin (as Percentage of Revenue Net of TAC) is used for Jul - Dec 2016 and 2017, and the 2021 Global Operating Profit Margin (as Percentage of Revenue Net of TAC) is used for 2022
[3] To estimate AdMob U S Operating Profit (Excluding App Promo-AdMob Overlap), AdMob U S Revenue Net of TAC (Excluding App Promo-AdMob Overlap), as calculated by Mr Lasinski, is multiplied by AdMob Global Operating Profit Margin (as Percentage of Revenue Net of TAC), as calculated in Exhibit 2B
[4] AdMob Signed-In U S Operating Profit (Excluding App Promo-AdMob Overlap) is calculated by multiplying AdMob U S Operating Profit (Excluding App Promo-AdMob Overlap) by the Share of Revenue from Signed-In Users, consistent with the method Mr Lasinski applies in his Schedule 3 4
[5] AdMob Signed-In sWAA-Off U S Operating Profit (Excluding App Promo-AdMob Overlap) is calculated by multiplying AdMob Signed-In U S Operating Profit (Excluding App Promo-AdMob Overlap) by the Share of Monthly Accounts with sWAA Off, consistent with the method Mr Lasinski applies in his Schedule 3 4
[6] Lasinski Report, Schedule 3 3; GOOG-RDGZ-00188469-491, at 475 This figure is drawn from an internal Google document on ChromeGuard's impact to Display Ads and is equal to the "conversion-based autobidding proportion" of revenue
[7] To calculate AdMob Total Disgorgement of Profit Damages Using Operating Profit - Scenario 1, AdMob Signed-In sWAA-Off U S Operating Profit (Excluding App Promo-AdMob Overlap) is multiplied by the Share of Revenues Attributable to Conversion Tracking, consistent with the method Mr Lasinski applies in his Schedule 3 3
[8] To calculate AdMob Signed-In sWAA-Off U S Operating Profit (Excluding App Promo-AdMob Overlap) Not Attributable to Conversion Tracking, AdMob Total Disgorgement of Profit Damages Using Operating Profit - Scenario 1 is subtracted from AdMob Signed-In sWAA-Off U S Operating Profit (Excluding App Promo-AdMob Overlap), consistent with the method Mr Lasinski applies in his Schedule 3 2
[9] Lasinski Report, Schedule 3 2
[10] To calculate AdMob Signed-In sWAA-Off U S Operating Profit (Excluding App Promo-AdMob Overlap) Not Attributable to Conversion Tracking and Adjusted for Diminished Ad Relevance with sWAA Off, AdMob Signed-In U S Operating Profit (Excluding App Promo-AdMob Overlap) Not Attributable to Conversion Tracking, as calculated above, is multiplied by the Apportionment for Diminished Ad Relevance with sWAA Off, consistent with the method Mr Lasinski applies in his Schedule 3 2
[11] To calculate AdMob Disgorgement of Profit Damages Using Operating Profit - Scenario 2, AdMob Disgorgement of Profit Damages Using Operating Profit - Scenario 1 is added to AdMob Signed-In sWAA-Off U S Operating Profit (Excluding App Promo-AdMob Overlap) Not Attributable to Conversion Tracking and Adjusted for Diminished Ad Relevance with sWAA Off, both of which are calculated above, consistent with the method Mr Lasinski applies in his Schedule 3 1

Exhibit 5C
Ad Manager Scenarios 1 and 2 Disgorgement of Profit Damages Using Operating Profit

	Jul. - Dec. 2016	2017	2018	2019	2020	2021	2022	Total
Ad Manager U S Revenue Net of TAC (Excluding App Promo-Ad Manager Overlap) [1]	$15,680,708	$56,450,548	$82,141,307	$100,269,870	$117,602,349	$175,971,678	$201,295,211	$749,411,671
AdMob Global Operating Profit Margin (as Percentage of Revenue Net of TAC) [2]	37 7%	37 7%	37 7%	40 7%	46 3%	53 8%	53 8%	
Ad Manager U S Operating Profit (Excluding App Promo-Ad Manager Overlap) [3]	$5,906,575	$21,263,671	$30,940,811	$40,799,464	$54,402,407	$94,671,330	$108,295,185	$356,279,444
Share of Revenue from Signed-In Users [1]	82 2%	82 2%	82 2%	82 2%	82 2%	82 2%	82 2%	
Ad Manager Signed-In U S Operating Profit (Excluding App Promo-Ad Manager Overlap) [4]	$4,853,783	$17,473,619	$25,425,898	$33,527,338	$44,705,682	$77,797,042	$88,992,571	$292,775,932
Share of Monthly Accounts with sWAA Off [1]	69 1%	33 3%	21 2%	18 0%	14 1%	14 2%	13 9%	
Ad Manager Signed-In sWAA-Off U S Operating Profit (Excluding App Promo-Ad Manager Overlap) [5]	$3,355,391	$5,815,715	$5,389,871	$6,038,138	$6,300,003	$11,082,562	$12,339,881	$50,321,562
Share of Revenue Attributable to Conversion Types Bid Against GA4F [6]	52 0%	52 0%	52 0%	52 0%	52 0%	52 0%	52 0%	
Ad Manager Total Disgorgement of Profit Damages Using Operating Profit - Scenario 1 [7]	**$1,744,803**	**$3,024,172**	**$2,802,733**	**$3,139,832**	**$3,276,002**	**$5,762,932**	**$6,416,738**	**$26,167,212**
Ad Manager Signed-In sWAA-Off U S Operating Profit (Excluding App Promo-Ad Manager Overlap) Not Attributable to Conversion Tracking [8]	$1,610,588	$2,791,543	$2,587,138	$2,898,306	$3,024,002	$5,319,630	$5,923,143	$24,154,350
Apportionment for Diminished Ad Relevance with sWAA Off [9]	50 4%	50 4%	50 4%	50 4%	50 4%	50 4%	50 4%	
Ad Manager Signed-In sWAA-Off U S Operating Profit (Excluding App Promo-Ad Manager Overlap) Not Attributable to Conversion Tracking and Adjusted for Diminished Ad Relevance [10]	$812,099	$1,407,567	$1,304,501	$1,461,399	$1,524,778	$2,682,292	$2,986,599	$12,179,235
Ad Manager Total Disgorgement of Profit Damages Using Operating Profit - Scenario 2 [11]	**$2,556,902**	**$4,431,739**	**$4,107,234**	**$4,601,231**	**$4,800,780**	**$8,445,225**	**$9,403,337**	**$38,346,448**

Notes and Sources:

[1] Lasinski Report, Schedule 4 4

[2] Exhibit 2B Because Ad Manager P&L data are not available, consistent with Mr Lasinski's approach, AdMob operating margin data are used for Ad Manager The 2018 Global Operating Profit Margin (as Percentage of Revenue Net of TAC) is used for Jul - Dec 2016 and 2017, and the 2021 Global Operating Profit Margin (as Percentage of Revenue Net of TAC) is used for 2022

[3] To estimate Ad Manager U S Operating Profit (Excluding App Promo-Ad Manager Overlap), Ad Manager U S Revenue Net of TAC (Excluding App Promo-Ad Manager Overlap), as calculated by Mr Lasinski, is multiplied by AdMob Global Operating Profit Margin (as Percentage of Revenue Net of TAC), as calculated in Exhibit 2B

[4] Ad Manager Signed-In U S Operating Profit (Excluding App Promo-Ad Manager Overlap) is calculated by multiplying Ad Manager U S Operating Profit (Excluding App Promo-Ad Manager Overlap) by the Share of Revenue from Signed-In Users, consistent with the method Mr Lasinski applies in his Schedule 4 4

[5] Ad Manager Signed-In sWAA-Off U S Operating Profit (Excluding App Promo-Ad Manager Overlap) is calculated by multiplying Ad Manager Signed-In U S Operating Profit (Excluding App Promo-Ad Manager Overlap) by the Share of Monthly Accounts with sWAA Off, consistent with the method Mr Lasinski applies in his Schedule 4 4

[6] Lasinski Report, Schedule 4 3; GOOG-RDGZ-00188469-491, at 475 This figure is drawn from an internal Google document on ChromeGuard's impact to Display Ads and is equal to the "conversion-based autobidding proportion" of revenue

[7] To calculate Ad Manager Total Disgorgement of Profit Damages Using Operating Profit - Scenario 1, Ad Manager Signed-In sWAA-Off U S Operating Profit (Excluding App Promo-Ad Manager Overlap) is multiplied by the Share of Revenues Attributable to Conversion Tracking, consistent with the method Mr Lasinski applies in his Schedule 4 3

[8] To calculate Ad Manager Signed-In sWAA-Off U S Operating Profit (Excluding App Promo-Ad Manager Overlap) Not Attributable to Conversion Tracking, Ad Manager Total Disgorgement of Profit Damages Using Operating Profit - Scenario 1 is subtracted from Ad Manager Signed-In sWAA-Off U S Operating Profit (Excluding App Promo-Ad Manager Overlap), consistent with the method Mr Lasinski applies in his Schedule 4 2

[9] Lasinski Report, Schedule 4 2

[10] To calculate Ad Manager Signed-In sWAA-Off U S Operating Profit (Excluding App Promo-Ad Manager Overlap) Not Attributable to Conversion Tracking and Adjusted for Diminished Ad Relevance with sWAA Off, Ad Manager Signed-In U S Operating Profit (Excluding App Promo-Ad Manager Overlap) Not Attributable to Conversion Tracking, as calculated above, is multiplied by the Apportionment for Diminished Ad Relevance with sWAA Off, consistent with the method Mr Lasinski applies in his Schedule 4 2

[11] To calculate Ad Manager Disgorgement of Profit Damages Using Operating Profit - Scenario 2, Ad Manager Disgorgement of Profit Damages Using Operating Profit - Scenario 1 is added to Ad Manager Signed-In sWAA-Off U S Operating Profit (Excluding App Promo-Ad Manager Overlap) Not Attributable to Conversion Tracking and Adjusted for Diminished Ad Relevance with sWAA Off, both of which are calculated above, consistent with the method Mr Lasinski applies in his Schedule 4 1

Exhibit 5D
Disgorgement of Profit Damages, by Metric: Operating Profit vs. Revenue Net of Traffic Acquisition Costs

($ Values in Thousands)

Scenario 1

Panel 1A Revenue Net of TAC (Lasinski Method)

	Jul. - Dec. 2016	2017	2018	2019	2020	2021	2022	Total
App Promo [1]	$4,639	$8,041	$7,452	$13,491	$39,490	$115,717	$143,190	$332,021
AdMob [1]	$13,624	$23,613	$21,884	$22,696	$20,829	$31,506	$35,080	$169,232
Ad Manager [1]	$4,632	$8,029	$7,441	$7,717	$7,082	$10,712	$11,927	$57,539
Total	**$22,895**	**$39,683**	**$36,777**	**$43,903**	**$67,401**	**$157,934**	**$190,197**	**$558,791**

Panel 1B Operating Profit

App Promo [2]	$890	$1,543	$2,164	$4,863	$17,738	$65,579	$81,148	$173,924
AdMob [3]	$5,132	$8,895	$8,243	$9,235	$9,635	$16,950	$18,873	$76,962
Ad Manager [4]	$1,745	$3,024	$2,803	$3,140	$3,276	$5,763	$6,417	$26,167
Total	**$7,767**	**$13,461**	**$13,210**	**$17,238**	**$30,649**	**$88,291**	**$106,438**	**$277,054**

% Reduction from Lasinski Method = -50.4%

($ Values in Thousands)

Scenario 2

Panel 2A Revenue Net of TAC (Lasinski Method)

	Jul. - Dec. 2016	2017	2018	2019	2020	2021	2022	Total
App Promo [5]	$4,639	$8,041	$7,452	$13,491	$39,490	$115,717	$143,190	$332,021
AdMob [5]	$19,965	$34,604	$32,070	$33,259	$30,523	$46,170	$51,408	$247,998
Ad Manager [5]	$6,788	$11,765	$10,904	$11,308	$10,378	$15,698	$17,479	$84,319
Total	**$31,392**	**$54,410**	**$50,426**	**$58,059**	**$80,391**	**$177,584**	**$212,076**	**$664,339**

Panel 2B Operating Profit

App Promo [2]	$890	$1,543	$2,164	$4,863	$17,738	$65,579	$81,148	$173,924
AdMob [3]	$7,520	$13,035	$12,080	$13,533	$14,120	$24,839	$27,657	$112,784
Ad Manager [4]	$2,557	$4,432	$4,107	$4,601	$4,801	$8,445	$9,403	$38,346
Total	**$10,967**	**$19,009**	**$18,351**	**$22,997**	**$36,659**	**$98,863**	**$118,208**	**$325,054**

% Reduction from Lasinski Method = -51.1%

Sources:
[1] Lasinski Report, Schedule 1.3.
[2] Exhibit 5A.
[3] Exhibit 5B.
[4] Exhibit 5C.
[5] Lasinski Report, Schedule 1.4.

Exhibit 6A
App Promo Scenarios 1 and 2 Disgorgement of Profit Damages Using Operating Profit and Adjusted for sWAA-Off Share of Impressions and Clicks

Panel A: Share of Impressions

	Jul. - Dec. 2016	2017	2018	2019	2020	2021	2022	Total
App Promo Signed-In sWAA-Off U S Operating Profit [1]	$14,833,128	$25,709,445	$36,059,281	$45,878,608	$60,333,761	$132,750,069	$147,810,593	$463,374,885
Google Display Impressions Opt-Out Rate as a Percentage of sWAA-Off Share of Accounts [2]	67 9%	67 9%	67 9%	67 9%	67 9%	67 9%	67 9%	
App Promo U S Operating Profit Adjusted for sWAA-Off Share of Impressions [3]	$10,065,039	$17,445,179	$24,468,074	$31,130,992	$40,939,555	$90,077,739	$100,297,078	$314,423,657
Share of Revenue Attributable to Conversion Types Bid Against GA4F [4]	6 0%	6 0%	6 0%	10 6%	29 4%	49 4%	54 9%	
App Promo Total Disgorgement of Profit Damages Using Operating Profit and Adjusted for sWAA-Off Share of Impressions - Scenarios 1 and 2 [5]	**$603,902**	**$1,046,711**	**$1,468,084**	**$3,299,885**	**$12,036,229**	**$44,498,403**	**$55,063,096**	**$118,016,311**

Panel B: Share of Clicks

	Jul. - Dec. 2016	2017	2018	2019	2020	2021	2022	Total
App Promo Signed-In sWAA-Off U S Operating Profit [1]	$14,833,128	$25,709,445	$36,059,281	$45,878,608	$60,333,761	$132,750,069	$147,810,593	$463,374,885
Google Display Clicks Opt-Out Rate as a Percentage of sWAA-Off Share of Accounts [2]	44 9%	44 9%	44 9%	44 9%	44 9%	44 9%	44 9%	
App Promo U S Operating Profit Adjusted for sWAA-Off Share of Clicks [3]	$6,657,858	$11,539,699	$16,185,229	$20,592,639	$27,080,843	$59,584,944	$66,344,869	$207,986,081
Share of Revenue Attributable to Conversion Types Bid Against GA4F [4]	6 0%	6 0%	6 0%	10 6%	29 4%	49 4%	54 9%	
App Promo Total Disgorgement of Profit Damages Using Operating Profit and Adjusted for sWAA-Off Share of Clicks - Scenarios 1 and 2 [5]	**$399,471**	**$692,382**	**$971,114**	**$2,182,820**	**$7,961,768**	**$29,434,962**	**$36,423,333**	**$78,065,850**

Notes and Sources:
[1] Exhibit 5A
[2] Exhibit 3 These shares are simple averages based on available data for the months of March 2022 through May 2022
[3] To calculate App Promo U S Operating Profit Adjusted for sWAA-Off Share of Impressions, App Promo Signed-In sWAA-Off U S Operating Profit, as calculated in Exhibit 5A, is multiplied by the average Google Display Impressions Opt-Out Rate as a Percentage of sWAA-Off Accounts Share calculated in Exhibit 3
[4] Lasinski Report, Schedule 2 1
[5] To calculate App Promo Total Disgorgement of Profit Damages Using Operating Profit and Adjusted for sWAA-Off Share of Impressions/Clicks - Scenarios 1 and 2, App Promo U S Operating Profit Adjusted for sWAA-Off Share of Impressions/Clicks, respectively, are multiplied by the Share of Revenue Attributable to Conversion Types Bid Against GA4F, consistent with the method Mr Lasinski applies in his Schedule 2 1

Exhibit 6B
AdMob Scenarios 1 and 2 Disgorgement of Profit Damages Using Operating Profit and Adjusted for sWAA-Off Share of Impressions and Clicks

Panel A: Share of Impressions

	Jul. - Dec. 2016	2017	2018	2019	2020	2021	2022	Total
AdMob Signed-In sWAA-Off U S Operating Profit (Excluding App Promo-AdMob Overlap) [1]	$9,868,797	$17,105,044	$15,852,563	$17,759,228	$18,529,422	$32,595,771	$36,293,769	$148,004,594
Google Display Impressions Opt-Out Rate as a Percentage of sWAA-Off Share of Accounts [2]	67 9%	67 9%	67 9%	67 9%	67 9%	67 9%	67 9%	
AdMob U S Operating Profit (Excluding App Promo-AdMob Overlap) Adjusted for sWAA-Off Share of Impressions [3]	$6,696,485	$11,606,651	$10,756,778	$12,050,548	$12,573,164	$22,117,905	$24,627,186	$100,428,718
Share of Revenues Attributable to Conversion Tracking [4]	52 0%	52 0%	52 0%	52 0%	52 0%	52 0%	52 0%	
AdMob Disgorgement of Profit Damages Using Operating Profit and Adjusted for sWAA-Off Share of Impressions - Scenario 1 [5]	**$3,482,172**	**$6,035,458**	**$5,593,525**	**$6,266,285**	**$6,538,046**	**$11,501,311**	**$12,806,137**	**$52,222,933**
AdMob Signed-In U S Operating Profit (Excluding App Promo-AdMob Overlap) Not Attributable to Conversion Tracking Adjusted for sWAA-Off Share of Impressions [6]	$3,214,313	$5,571,192	$5,163,254	$5,784,263	$6,035,119	$10,616,594	$11,821,049	$48,205,785
Apportionment for Diminished Ad Relevance with sWAA Off [7]	50 4%	50 4%	50 4%	50 4%	50 4%	50 4%	50 4%	
AdMob Signed-In U S Operating Profit (Excluding App Promo-AdMob Overlap) Not Attributable to Conversion Tracking and Adjusted for Diminished Ad Relevance with sWAA Off and sWAA-Off Share of Impressions [8]	$1,620,738	$2,809,136	$2,603,443	$2,916,572	$3,043,060	$5,353,156	$5,960,473	$24,306,579
AdMob Disgorgement of Profit Damages Using Operating Profit and Adjusted for sWAA-Off Share of Impressions - Scenario 2 [9]	**$5,102,911**	**$8,844,595**	**$8,196,968**	**$9,182,857**	**$9,581,105**	**$16,854,467**	**$18,766,609**	**$76,529,512**

Panel B: Share of Clicks

	Jul. - Dec. 2016	2017	2018	2019	2020	2021	2022	Total
AdMob Signed-In sWAA-Off U S Operating Profit (Excluding App Promo-AdMob Overlap) [1]	$9,868,797	$17,105,044	$15,852,563	$17,759,228	$18,529,422	$32,595,771	$36,293,769	$148,004,594
Google Display Clicks Opt-Out Rate as a Percentage of sWAA-Off Share of Accounts [2]	44 9%	44 9%	44 9%	44 9%	44 9%	44 9%	44 9%	
AdMob U S Operating Profit (Excluding App Promo-AdMob Overlap) Adjusted for sWAA-Off Share of Clicks [3]	$4,429,615	$7,677,609	$7,115,432	$7,971,240	$8,316,942	$14,630,631	$16,290,479	$66,431,946
Share of Revenues Attributable to Conversion Tracking [4]	52 0%	52 0%	52 0%	52 0%	52 0%	52 0%	52 0%	
AdMob Disgorgement of Profit Damages Using Operating Profit and Adjusted for sWAA-Off Share of Clicks - Scenario 1 [5]	**$2,303,400**	**$3,992,356**	**$3,700,025**	**$4,145,045**	**$4,324,810**	**$7,607,928**	**$8,471,049**	**$34,544,612**
AdMob Signed-In U S Operating Profit (Excluding App Promo-AdMob Overlap) Not Attributable to Conversion Tracking Adjusted for sWAA-Off Share of Clicks [6]	$2,126,215	$3,685,252	$3,415,407	$3,826,195	$3,992,132	$7,022,703	$7,819,430	$31,887,334
Apportionment for Diminished Ad Relevance with sWAA Off [7]	50 4%	50 4%	50 4%	50 4%	50 4%	50 4%	50 4%	
AdMob Signed-In U S Operating Profit (Excluding App Promo-AdMob Overlap) Not Attributable to Conversion Tracking and Adjusted for Diminished Ad Relevance with sWAA Off and sWAA-Off Share of Clicks [8]	$1,072,092	$1,858,198	$1,722,135	$1,929,265	$2,012,934	$3,541,025	$3,942,755	$16,078,402
AdMob Disgorgement of Profit Damages Using Operating Profit and Adjusted for sWAA-Off Share of Clicks - Scenario 2 [9]	**$3,375,491**	**$5,850,554**	**$5,422,160**	**$6,074,309**	**$6,337,744**	**$11,148,953**	**$12,413,804**	**$50,623,014**

Exhibit 6B
AdMob Scenarios 1 and 2 Disgorgement of Profit Damages Using Operating Profit and Adjusted for sWAA-Off Share of Impressions and Clicks

Notes and Sources:

[1] Exhibit 5B

[2] Exhibit 3 These shares are simple averages based on available data for the months of March 2022 through May 2022

[3] To calculate AdMob U S Operating Profit (Excluding App Promo-AdMob Overlap) Adjusted for sWAA-Off Share of Impressions/Clicks, AdMob Signed-In sWAA-Off U S Operating Profit (Excluding App Promo-AdMob Overlap), as calculated in Exhibit 5B, is multiplied by the average Google Display Impressions/Clicks Opt-Out Rate as a Percentage of sWAA-Off Accounts Share calculated in Exhibit 3

[4] Lasinski Report, Schedule 3 3; GOOG-RDGZ-00188469-491, at 475 This figure is drawn from an internal Google document on ChromeGuard's impact to Display Ads and is equal to the "conversion-based autobidding proportion" of revenue

[5] To calculate AdMob Disgorgement of Profit Damages Using Operating Profit and Adjusted for sWAA-Off Share of Impressions/Clicks - Scenario 1, AdMob U S Operating Profit (Excluding App Promo-AdMob Overlap) Adjusted for sWAA-Off Share of Impressions/Clicks, respectively, is multiplied by the Share of Revenues Attributable to Conversion Tracking, consistent with the method Mr Lasinski applies in his Schedule 3 3

[6] To calculate AdMob Signed-In U S Operating Profit (Excluding App Promo-AdMob Overlap) Not Attributable to Conversion Tracking Adjusted for sWAA-Off Share of Impressions/Clicks, AdMob Disgorgement of Profit Damages Using Operating Profit and Adjusted for sWAA-Off Share of Impressions/Clicks - Scenario 1, respectively, as calculated above, is subtracted from AdMob U S Operating Profit (Excluding App Promo-AdMob Overlap) Adjusted for sWAA-Off Share of Impressions/Clicks, respectively

[7] Lasinski Report, Schedule 3 2

[8] To calculate AdMob Signed-In U S Operating Profit (Excluding App Promo-AdMob Overlap) Not Attributable to Conversion Tracking and Adjusted for Diminished Ad Relevance with sWAA Off and sWAA-Off Share of Impressions/Clicks, AdMob Signed-In U S Operating Profit (Excluding App Promo-AdMob Overlap) Not Attributable to Conversion Tracking Adjusted for sWAA-Off Share of Impressions/Clicks, respectively, as calculated above, is multiplied by the Apportionment for Diminished Ad Relevance with sWAA Off, consistent with the method Mr Lasinski applies in his Schedule 3 2

[9] To calculate AdMob Disgorgement of Profit Damages Using Operating Profit and Adjusted for sWAA-Off Share of Impressions/Clicks - Scenario 2, AdMob Disgorgement of Profit Damages Adjusted for sWAA-Off Share of Impressions/Clicks - Scenario 1, respectively, is added to AdMob Signed-In U S Operating Profit (Excluding App Promo-AdMob Overlap) Not Attributable to Conversion Tracking and Adjusted for Diminished Ad Relevance with sWAA Off and sWAA-Off Share of Impressions/Clicks, respectively, both of which are calculated above, consistent with the method Mr Lasinski applies in his Schedule 3 1

Exhibit 6C
Ad Manager Scenarios 1 and 2 Disgorgement of Profit Damages Using Operating Profit and Adjusted for sWAA-Off Share of Impressions and Clicks

Panel A: Share of Impressions

	Jul. - Dec. 2016	2017	2018	2019	2020	2021	2022	Total
Ad Manager Signed-In sWAA-Off U S Operating Profit (Excluding App Promo-Ad Manager Overlap) [1]	$3,355,391	$5,815,715	$5,389,871	$6,038,138	$6,300,003	$11,082,562	$12,339,881	$50,321,562
Google Display Impressions Opt-Out Rate as a Percentage of sWAA-Off Share of Accounts [2]	67 9%	67 9%	67 9%	67 9%	67 9%	67 9%	67 9%	
Ad Manager U S Operating Profit (Excluding App Promo-Ad Manager Overlap) Adjusted for sWAA-Off Share of Impressions [3]	$2,276,805	$3,946,261	$3,657,305	$4,097,186	$4,274,876	$7,520,088	$8,373,243	$34,145,764
Share of Revenues Attributable to Conversion Tracking [4]	52 0%	52 0%	52 0%	52 0%	52 0%	52 0%	52 0%	
Ad Manager Disgorgement of Profit Damages Using Operating Profit and Adjusted for sWAA-Off Share of Impressions - Scenario 1 [5]	**$1,183,939**	**$2,052,056**	**$1,901,798**	**$2,130,537**	**$2,222,935**	**$3,910,446**	**$4,354,086**	**$17,755,797**
Ad Manager Signed-In U S Operating Profit (Excluding App Promo-Ad Manager Overlap) Not Attributable to Conversion Tracking Adjusted for sWAA-Off Share of Impressions [6]	$1,092,866	$1,894,205	$1,755,506	$1,966,649	$2,051,940	$3,609,642	$4,019,157	$16,389,967
Apportionment for Diminished Ad Relevance with sWAA Off [7]	50 4%	50 4%	50 4%	50 4%	50 4%	50 4%	50 4%	
Ad Manager Signed-In U S Operating Profit (Excluding App Promo-Ad Manager Overlap) Not Attributable to Conversion Tracking and Adjusted for Diminished Ad Relevance with sWAA Off and sWAA-Off Share of Impressions [8]	$551,051	$955,106	$885,171	$991,635	$1,034,640	$1,820,073	$2,026,561	$8,264,237
Ad Manager Disgorgement of Profit Damages Using Operating Profit and Adjusted for sWAA-Off Share of Impressions - Scenario 2 [9]	**$1,734,990**	**$3,007,162**	**$2,786,969**	**$3,122,171**	**$3,257,576**	**$5,730,519**	**$6,380,647**	**$26,020,034**

Panel B: Share of Clicks

	Jul. - Dec. 2016	2017	2018	2019	2020	2021	2022	Total
Ad Manager Signed-In sWAA-Off U S Operating Profit (Excluding App Promo-Ad Manager Overlap) [1]	$3,355,391	$5,815,715	$5,389,871	$6,038,138	$6,300,003	$11,082,562	$12,339,881	$50,321,562
Google Display Clicks Opt-Out Rate as a Percentage of sWAA-Off Share of Accounts [2]	44 9%	44 9%	44 9%	44 9%	44 9%	44 9%	44 9%	
Ad Manager U S Operating Profit (Excluding App Promo-Ad Manager Overlap) Adjusted for sWAA-Off Share of Clicks [3]	$1,506,069	$2,610,387	$2,419,247	$2,710,221	$2,827,760	$4,974,414	$5,538,763	$22,586,862
Share of Revenues Attributable to Conversion Tracking [4]	52 0%	52 0%	52 0%	52 0%	52 0%	52 0%	52 0%	
Ad Manager Disgorgement of Profit Damages Using Operating Profit and Adjusted for sWAA-Off Share of Clicks - Scenario 1 [5]	**$783,156**	**$1,357,401**	**$1,258,008**	**$1,409,315**	**$1,470,435**	**$2,586,695**	**$2,880,157**	**$11,745,168**
Ad Manager Signed-In U S Operating Profit (Excluding App Promo-Ad Manager Overlap) Not Attributable to Conversion Tracking Adjusted for sWAA-Off Share of Clicks [6]	$722,913	$1,252,986	$1,161,239	$1,300,906	$1,357,325	$2,387,719	$2,658,606	$10,841,694
Apportionment for Diminished Ad Relevance with sWAA Off [7]	50 4%	50 4%	50 4%	50 4%	50 4%	50 4%	50 4%	
Ad Manager Signed-In U S Operating Profit (Excluding App Promo-Ad Manager Overlap) Not Attributable to Conversion Tracking and Adjusted for Diminished Ad Relevance with sWAA Off and sWAA-Off Share of Clicks [8]	$364,511	$631,787	$585,526	$655,950	$684,398	$1,203,948	$1,340,537	$5,466,657
Ad Manager Disgorgement of Profit Damages Using Operating Profit and Adjusted for sWAA-Off Share of Clicks - Scenario 2 [9]	**$1,147,667**	**$1,989,188**	**$1,843,534**	**$2,065,265**	**$2,154,833**	**$3,790,644**	**$4,220,693**	**$17,211,825**

Exhibit 6C
Ad Manager Scenarios 1 and 2 Disgorgement of Profit Damages Using Operating Profit and Adjusted for sWAA-Off Share of Impressions and Clicks

Notes and Sources:

[1] Exhibit 5C

[2] Exhibit 3 These shares are simple averages based on available data for the months of March 2022 through May 2022

[3] To calculate Ad Manager U S Operating Profit (Excluding App Promo-Ad Manager Overlap) Adjusted for sWAA-Off Share of Impressions/Clicks, Ad Manager Signed-In sWAA-Off U S Operating Profit (Excluding App Promo-Ad Manager Overlap), as calculated in Exhibit 5C, is multiplied by the average Google Display Impressions/Clicks Opt-Out Rate as a Percentage of sWAA-Off Accounts Share calculated in Exhibit 3

[4] Lasinski Report, Schedule 4 3; GOOG-RDGZ-00188469-491, at 475 This figure is drawn from an internal Google document on ChromeGuard's impact to Display Ads and is equal to the "conversion-based autobidding proportion" of revenue

[5] To calculate Ad Manager Disgorgement of Profit Damages Using Operating Profit and Adjusted for sWAA-Off Share of Impressions/Clicks - Scenario 1, Ad Manager U S Operating Profit (Excluding App Promo-Ad Manager Overlap) Adjusted for sWAA-Off Share of Impressions/Clicks, respectively, is multiplied by the Share of Revenues Attributable to Conversion Tracking, consistent with the method Mr Lasinski applies in his Schedule 4 3

[6] To calculate Ad Manager Signed-In U S Operating Profit (Excluding App Promo-Ad Manager Overlap) Not Attributable to Conversion Tracking Adjusted for sWAA-Off Share of Impressions/Clicks, Ad Manager Disgorgement of Profit Damages Using Operating Profit and Adjusted for sWAA-Off Share of Impressions/Clicks - Scenario 1, respectively, as calculated above, is subtracted from Ad Manager U S Operating Profit (Excluding App Promo-Ad Manager Overlap) Adjusted for sWAA-Off Share of Impressions/Clicks, respectively

[7] Lasinski Report, Schedule 4 2

[8] To calculate Ad Manager Signed-In U S Operating Profit (Excluding App Promo-Ad Manager Overlap) Not Attributable to Conversion Tracking and Adjusted for Diminished Ad Relevance with sWAA Off and sWAA-Off Share of Impressions/Clicks, Ad Manager Signed-In U S Operating Profit (Excluding App Promo-Ad Manager Overlap) Not Attributable to Conversion Tracking Adjusted for sWAA-Off Share of Impressions/Clicks, respectively, as calculated above, is multiplied by the Apportionment for Diminished Ad Relevance with sWAA Off, consistent with the method Mr Lasinski applies in his Schedule 4 2

[9] To calculate Ad Manager Disgorgement of Profit Damages Using Operating Profit and Adjusted for sWAA-Off Share of Impressions/Clicks - Scenario 2, Ad Manager Disgorgement of Profit Damages Adjusted for sWAA-Off Share of Impressions/Clicks - Scenario 1, respectively, is added to Ad Manager Signed-In U S Operating Profit (Excluding App Promo-Ad Manager Overlap) Not Attributable to Conversion Tracking and Adjusted for Diminished Ad Relevance with sWAA Off and sWAA-Off Share of Impressions/Clicks, respectively, both of which are calculated above, consistent with the method Mr Lasinski applies in his Schedule 4 1

Exhibit 6D
Scenario 1 Disgorgement of Profit Damages, by Revenue/Profit Metric and sWAA-Off Share Adjustment

($ Values in Thousands)

Panel A Revenue Net of TAC & Share of Accounts (Lasinski Method)

	Jul. - Dec. 2016	2017	2018	2019	2020	2021	2022	Total
App Promo [1]	$4,639	$8,041	$7,452	$13,491	$39,490	$115,717	$143,190	$332,021
AdMob [1]	$13,624	$23,613	$21,884	$22,696	$20,829	$31,506	$35,080	$169,232
Ad Manager [1]	$4,632	$8,029	$7,441	$7,717	$7,082	$10,712	$11,927	$57,539
Total	**$22,895**	**$39,683**	**$36,777**	**$43,903**	**$67,401**	**$157,934**	**$190,197**	**$558,791**

Panel B Operating Profit & Share of Impressions

	Jul. - Dec. 2016	2017	2018	2019	2020	2021	2022	Total
App Promo [2]	$604	$1,047	$1,468	$3,300	$12,036	$44,498	$55,063	$118,016
AdMob [3]	$3,482	$6,035	$5,594	$6,266	$6,538	$11,501	$12,806	$52,223
Ad Manager [4]	$1,184	$2,052	$1,902	$2,131	$2,223	$3,910	$4,354	$17,756
Total	**$5,270**	**$9,134**	**$8,963**	**$11,697**	**$20,797**	**$59,910**	**$72,223**	**$187,995**

% Reduction from Lasinski Method = -66.4%

Panel C Operating Profit & Share of Clicks

	Jul. - Dec. 2016	2017	2018	2019	2020	2021	2022	Total
App Promo [2]	$399	$692	$971	$2,183	$7,962	$29,435	$36,423	$78,066
AdMob [3]	$2,303	$3,992	$3,700	$4,145	$4,325	$7,608	$8,471	$34,545
Ad Manager [4]	$783	$1,357	$1,258	$1,409	$1,470	$2,587	$2,880	$11,745
Total	**$3,486**	**$6,042**	**$5,929**	**$7,737**	**$13,757**	**$39,630**	**$47,775**	**$124,356**

% Reduction from Lasinski Method = -77.7%

Sources:
[1] Lasinski Report, Schedule 1.3.
[2] Exhibit 6A.
[3] Exhibit 6B.
[4] Exhibit 6C.

Exhibit 6E
Scenario 2 Disgorgement of Profit Damages, by Revenue/Profit Metric and sWAA-Off Share Adjustment

($ Values in Thousands)

Panel A Revenue Net of TAC & Share of Accounts (Lasinski Method)

	Jul. - Dec. 2016	2017	2018	2019	2020	2021	2022	Total
App Promo [1]	$4,639	$8,041	$7,452	$13,491	$39,490	$115,717	$143,190	$332,021
AdMob [1]	$19,965	$34,604	$32,070	$33,259	$30,523	$46,170	$51,408	$247,998
Ad Manager [1]	$6,788	$11,765	$10,904	$11,308	$10,378	$15,698	$17,479	$84,319
Total	**$31,392**	**$54,410**	**$50,426**	**$58,059**	**$80,391**	**$177,584**	**$212,076**	**$664,339**

Panel B Operating Profit & Share of Impressions

	Jul. - Dec. 2016	2017	2018	2019	2020	2021	2022	Total
App Promo [2]	$604	$1,047	$1,468	$3,300	$12,036	$44,498	$55,063	$118,016
AdMob [3]	$5,103	$8,845	$8,197	$9,183	$9,581	$16,854	$18,767	$76,530
Ad Manager [4]	$1,735	$3,007	$2,787	$3,122	$3,258	$5,731	$6,381	$26,020
Total	**$7,442**	**$12,898**	**$12,452**	**$15,605**	**$24,875**	**$67,083**	**$80,210**	**$220,566**
% Reduction from Lasinski Method = -66.8%								

Panel C Operating Profit & Share of Clicks

	Jul. - Dec. 2016	2017	2018	2019	2020	2021	2022	Total
App Promo [2]	$399	$692	$971	$2,183	$7,962	$29,435	$36,423	$78,066
AdMob [3]	$3,375	$5,851	$5,422	$6,074	$6,338	$11,149	$12,414	$50,623
Ad Manager [4]	$1,148	$1,989	$1,844	$2,065	$2,155	$3,791	$4,221	$17,212
Total	**$4,923**	**$8,532**	**$8,237**	**$10,322**	**$16,454**	**$44,375**	**$53,058**	**$145,901**
% Reduction from Lasinski Method = -78.0%								

Sources:
[1] Lasinski Report, Schedule 1.4.
[2] Exhibit 6A.
[3] Exhibit 6B.
[4] Exhibit 6C.

Exhibit 7A
App Promo Signed-In sWAA-Off U.S. Operating Profit Net of TAC Adjusted for sWAA-Off Share of Impressions and Clicks
Excluding iOS Users After iOS 14 (2021-2022)

Panel A: Share of Impressions

	Jul. - Dec. 2016	2017	2018	2019	2020	2021	2022	Total
App Promo Signed-In sWAA-Off U S Operating Profit [1]	$14,833,128	$25,709,445	$36,059,281	$45,878,608	$60,333,761	$132,750,069	$147,810,593	$463,374,885
U S iOS Mobile Market Share After iOS 14 [2]	0 0%	0 0%	0 0%	0 0%	0 0%	58 6%	56 7%	
App Promo Signed-In sWAA-Off U S Operating Profit Excluding iOS Users After iOS 14 [3]	$14,833,128	$25,709,445	$36,059,281	$45,878,608	$60,333,761	$54,958,529	$63,951,485	$301,724,236
Google Display Impressions Opt-Out Rate as a Percentage of sWAA-Off Share of Accounts [4]	67 9%	67 9%	67 9%	67 9%	67 9%	67 9%	67 9%	
App Promo U.S. Operating Profit Adjusted for sWAA-Off Share of Impressions and Excluding iOS Users After iOS 14	**$10,065,039**	**$17,445,179**	**$24,468,074**	**$31,130,992**	**$40,939,555**	**$37,292,184**	**$43,394,367**	**$204,735,390**

Panel B: Share of Clicks

	Jul. - Dec. 2016	2017	2018	2019	2020	2021	2022	Total
App Promo Signed-In sWAA-Off U S Operating Profit [1]	$14,833,128	$25,709,445	$36,059,281	$45,878,608	$60,333,761	$132,750,069	$147,810,593	$463,374,885
U S iOS Mobile Market Share After iOS 14 [2]	0 0%	0 0%	0 0%	0 0%	0 0%	58 6%	56 7%	
App Promo Signed-In sWAA-Off U S Operating Profit Excluding iOS Users After iOS 14 [3]	$14,833,128	$25,709,445	$36,059,281	$45,878,608	$60,333,761	$54,958,529	$63,951,485	$301,724,236
Google Display Clicks Opt-Out Rate as a Percentage of sWAA-Off Share of Accounts [4]	44 9%	44 9%	44 9%	44 9%	44 9%	44 9%	44 9%	
App Promo U.S. Operating Profit Adjusted for sWAA-Off Share of Clicks and Excluding iOS Users After iOS 14	**$6,657,858**	**$11,539,699**	**$16,185,229**	**$20,592,639**	**$27,080,843**	**$24,668,167**	**$28,704,660**	**$135,429,095**

Notes and Sources:
[1] Exhibit 5A
[2] "Market share of mobile operating systems in the United States from January 2012 to March 2023," Statista, March 2023, available at https://www statista com/statistics/272700/market-share-held-by-mobile-operating-systems-in-the-us-since-2009/ The U S iOS Mobile Market Share After iOS 14 is the monthly average U S iOS market share for 2021 and 2022
[3] App Promo Signed-In sWAA-Off U S Operating Profit Excluding iOS Users After iOS 14 is calculated by multiplying App Promo Signed-In sWAA-Off U S Operating Profit, as calculated in Exhibit 5A, by the difference between 1 and the U S iOS Mobile Market Share After iOS 14
[4] Exhibit 3 These shares are based on available data for the months of March 2022 through May 2022

Exhibit 7B

AdMob Signed-In sWAA-Off U.S. Operating Profit Excluding App Promo-AdMob Overlap Adjusted for sWAA-Off Share of Impressions and Clicks

Excluding iOS Users After iOS 14 (2021-2022)

Panel A: Share of Impressions

	Jul. - Dec. 2016	2017	2018	2019	2020	2021	2022	Total
AdMob Signed-In sWAA-Off U S Operating Profit (Excluding App Promo-AdMob Overlap) [1]	$9,868,797	$17,105,044	$15,852,563	$17,759,228	$18,529,422	$32,595,771	$36,293,769	$148,004,594
U S iOS Mobile Market Share After iOS 14 [2]	0 0%	0 0%	0 0%	0 0%	0 0%	58 6%	56 7%	
AdMob Signed-In sWAA-Off U S Operating Profit (Excluding App Promo-AdMob Overlap) Excluding iOS Users After iOS 14 [3]	$9,868,797	$17,105,044	$15,852,563	$17,759,228	$18,529,422	$13,494,649	$15,702,801	$108,312,505
Google Display Impressions Opt-Out Rate as a Percentage of sWAA-Off Share of Accounts [4]	67 9%	67 9%	67 9%	67 9%	67 9%	67 9%	67 9%	
AdMob U.S. Operating Profit (Excluding App Promo-AdMob Overlap) Adjusted for sWAA-Off Share of Impressions and Excluding iOS Users After iOS 14	**$6,696,485**	**$11,606,651**	**$10,756,778**	**$12,050,548**	**$12,573,164**	**$9,156,813**	**$10,655,157**	**$73,495,597**

Panel B: Share of Clicks

	Jul. - Dec. 2016	2017	2018	2019	2020	2021	2022	Total
AdMob Signed-In sWAA Off U S Operating Profit (Excluding App Promo-AdMob Overlap) [1]	$9,868,797	$17,105,044	$15,852,563	$17,759,228	$18,529,422	$32,595,771	$36,293,769	$148,004,594
U S iOS Mobile Market Share After iOS 14 [2]	0 0%	0 0%	0 0%	0 0%	0 0%	58 6%	56 7%	
AdMob Signed-In sWAA-Off U S Operating Profit (Excluding App Promo-AdMob Overlap) Excluding iOS Users After iOS 14 [3]	$9,868,797	$17,105,044	$15,852,563	$17,759,228	$18,529,422	$13,494,649	$15,702,801	$108,312,505
Google Display Clicks Opt-Out Rate as a Percentage of sWAA-Off Share of Accounts [4]	44 9%	44 9%	44 9%	44 9%	44 9%	44 9%	44 9%	
AdMob U.S. Operating Profit (Excluding App Promo-AdMob Overlap) Adjusted for sWAA-Off Share of Clicks and Excluding iOS Users After iOS 14	**$4,429,615**	**$7,677,609**	**$7,115,432**	**$7,971,240**	**$8,316,942**	**$6,057,081**	**$7,048,211**	**$48,616,129**

Notes and Sources:

[1] Exhibit 5B

[2] "Market share of mobile operating systems in the United States from January 2012 to March 2023," Statista, March 2023, available at https://www statista com/statistics/272700/market-share-held-by-mobile-operating-systems-in-the-us-since-2009/ The U S iOS Mobile Market Share After iOS 14 is the monthly average U S iOS market share for 2021 and 2022

[3] AdMob Signed-In sWAA-Off U S Operating Profit (Excluding App Promo-AdMob Overlap) Excluding iOS Users After iOS 14 is calculated by multiplying AdMob Signed-In sWAA-Off U S Operating Profit (Excluding App Promo-AdMob Overlap), as calculated in Exhibit 5B, by the difference between 1 and the U S iOS Mobile Market Share After iOS 14

[4] Exhibit 3 These shares are based on available data for the months of March 2022 through May 2022

Exhibit 7C

Ad Manager Signed-In sWAA-Off U.S. Operating Profit Excluding App Promo-Ad Manager Overlap Adjusted for sWAA-Off Share of Impressions and Clicks

Excluding iOS Users After iOS 14 (2021-2022)

Panel A: Share of Impressions

	Jul. - Dec. 2016	2017	2018	2019	2020	2021	2022	Total
Ad Manager Signed-In sWAA-Off U S Operating Profit (Excluding App Promo-Ad Manager Overlap) [1]	$3,355,391	$5,815,715	$5,389,871	$6,038,138	$6,300,003	$11,082,562	$12,339,881	$50,321,562
U S iOS Mobile Market Share After iOS 14 [2]	0 0%	0 0%	0 0%	0 0%	0 0%	58 6%	56 7%	
Ad Manager Signed-In sWAA-Off U S Operating Profit (Excluding App Promo-Ad Manager Overlap) Excluding iOS Users After iOS 14 [3]	$3,355,391	$5,815,715	$5,389,871	$6,038,138	$6,300,003	$4,588,181	$5,338,952	$36,826,252
Google Display Impressions Opt-Out Rate as a Percentage of sWAA-Off Share of Accounts [4]	67 9%	67 9%	67 9%	67 9%	67 9%	67 9%	67 9%	
Ad Manager U.S. Operating Profit (Excluding App Promo-Ad Manager Overlap) Adjusted for sWAA-Off Share of Impressions and Excluding iOS Users After iOS 14	**$2,276,805**	**$3,946,261**	**$3,657,305**	**$4,097,186**	**$4,274,876**	**$3,113,316**	**$3,622,753**	**$24,988,503**

Panel B: Share of Clicks

	Jul. - Dec. 2016	2017	2018	2019	2020	2021	2022	Total
Ad Manager Signed-In sWAA-Off U S Operating Profit (Excluding App Promo-Ad Manager Overlap) [1]	$3,355,391	$5,815,715	$5,389,871	$6,038,138	$6,300,003	$11,082,562	$12,339,881	$50,321,562
U S iOS Mobile Market Share After iOS 14 [2]	0 0%	0 0%	0 0%	0 0%	0 0%	58 6%	56 7%	
Ad Manager Signed-In sWAA-Off U S Operating Profit (Excluding App Promo-Ad Manager Overlap) Excluding iOS Users After iOS 14 [3]	$3,355,391	$5,815,715	$5,389,871	$6,038,138	$6,300,003	$4,588,181	$5,338,952	$36,826,252
Google Display Clicks Opt-Out Rate as a Percentage of sWAA-Off Share of Accounts [4]	44 9%	44 9%	44 9%	44 9%	44 9%	44 9%	44 9%	
Ad Manager U.S. Operating Profit (Excluding App Promo-Ad Manager Overlap) Adjusted for sWAA-Off Share of Clicks and Excluding iOS Users After iOS 14	**$1,506,069**	**$2,610,387**	**$2,419,247**	**$2,710,221**	**$2,827,760**	**$2,059,408**	**$2,396,392**	**$16,529,484**

Notes and Sources:

[1] Exhibit 5C

[2] "Market share of mobile operating systems in the United States from January 2012 to March 2023," Statista, March 2023, available at https://www statista com/statistics/272700/market-share-held-by-mobile-operating-systems-in-the-us-since-2009/ The U S iOS Mobile Market Share After iOS 14 is the monthly average U S iOS market share for 2021 and 2022

[3] Ad Manager Signed-In sWAA-Off U S Operating Profit (Excluding App Promo-Ad Manager Overlap) Excluding iOS Users After iOS 14 is calculated by multiplying Ad Manager Signed-In sWAA-Off U S Operating Profit (Excluding App Promo-Ad Manager Overlap), as calculated in Exhibit 5C, by the difference between 1 and the U S iOS Mobile Market Share After iOS 14

[4] Exhibit 3 These shares are based on available data for the months of March 2022 through May 2022

Exhibit 7D
Scenario 1 Disgorgement of Profit Damages, by Revenue/Profit Metric and sWAA-Off Share Adjustment
Excluding iOS Users After iOS 14 (2021-2022)

($ Values in Thousands)

Panel A Revenue Net of TAC & Share of Accounts (Lasinski Method)

	Jul. - Dec. 2016	2017	2018	2019	2020	2021	2022	Total
App Promo [1]	$4,639	$8,041	$7,452	$13,491	$39,490	$115,717	$143,190	$332,021
AdMob [1]	$13,624	$23,613	$21,884	$22,696	$20,829	$31,506	$35,080	$169,232
Ad Manager [1]	$4,632	$8,029	$7,441	$7,717	$7,082	$10,712	$11,927	$57,539
Total	**$22,895**	**$39,683**	**$36,777**	**$43,903**	**$67,401**	**$157,934**	**$190,197**	**$558,791**

Panel B Operating Profit & Share of Impressions

	Jul. - Dec. 2016	2017	2018	2019	2020	2021	2022	Total
App Promo [2]	$604	$1,047	$1,468	$3,300	$12,036	$18,422	$23,824	$60,701
AdMob [3]	$3,482	$6,035	$5,594	$6,266	$6,538	$4,762	$5,541	$38,218
Ad Manager [4]	$1,184	$2,052	$1,902	$2,131	$2,223	$1,619	$1,884	$12,994
Total	**$5,270**	**$9,134**	**$8,963**	**$11,697**	**$20,797**	**$24,803**	**$31,248**	**$111,912**
% Reduction from Lasinski Method = -80.0%								

Panel C Operating Profit & Share of Clicks

	Jul. - Dec. 2016	2017	2018	2019	2020	2021	2022	Total
App Promo [2]	$399	$692	$971	$2,183	$7,962	$12,186	$15,759	$40,152
AdMob [3]	$2,303	$3,992	$3,700	$4,145	$4,325	$3,150	$3,665	$25,280
Ad Manager [4]	$783	$1,357	$1,258	$1,409	$1,470	$1,071	$1,246	$8,595
Total	**$3,486**	**$6,042**	**$5,929**	**$7,737**	**$13,757**	**$16,407**	**$20,670**	**$74,028**
% Reduction from Lasinski Method = -86.8%								

Notes and Sources:

[1] Lasinski Report, Schedule 1.3.

[2] Exhibit 7A; Lasinski Report, Schedule 2.1. To calculate disgorgement of profit damages for App Promo under Mr. Lasinski's Scenario 1, the operating profits displayed in Exhibit 7A were multiplied by the Share of Revenue Attributable to Conversion Types Bid Against GA4F displayed in Schedule 2.1 of the Lasinski Report.

[3] Exhibit 7B; Lasinski Report, Schedule 3.3. To calculate disgorgement of profit damages for AdMob under Mr. Lasinski's Scenario 1, the operating profits displayed in Exhibit 7B were multiplied by 52% (the Share of Revenues Attributable to Conversion Tracking), as done in Schedule 3.3 of the Lasinski Report.

[4] Exhibit 7C; Lasinski Report, Schedule 4.3. To calculate disgorgement of profit damages for Ad Manager under Mr. Lasinski's Scenario 1, the operating profits displayed in Exhibit 7C were multiplied by 52% (the Share of Revenues Attributable to Conversion Tracking), as done in Schedule 4.3 of the Lasinski Report.

Exhibit 7E
Scenario 2 Disgorgement of Profit Damages, by Revenue/Profit Metric and sWAA-Off Share Adjustment
Excluding iOS Users After iOS 14 (2021-2022)

($ Values in Thousands)

Panel A Revenue Net of TAC & Share of Accounts (Lasinski Method)

	Jul. - Dec. 2016	2017	2018	2019	2020	2021	2022	Total
App Promo [1]	$4,639	$8,041	$7,452	$13,491	$39,490	$115,717	$143,190	$332,021
AdMob [1]	$19,965	$34,604	$32,070	$33,259	$30,523	$46,170	$51,408	$247,998
Ad Manager [1]	$6,788	$11,765	$10,904	$11,308	$10,378	$15,698	$17,479	$84,319
Total	**$31,392**	**$54,410**	**$50,426**	**$58,059**	**$80,391**	**$177,584**	**$212,076**	**$664,339**

Panel B Operating Profit & Share of Impressions

	Jul. - Dec. 2016	2017	2018	2019	2020	2021	2022	Total
App Promo [2]	$604	$1,047	$1,468	$3,300	$12,036	$18,422	$23,824	$60,701
AdMob [3]	$5,103	$8,845	$8,197	$9,183	$9,581	$6,978	$8,120	$56,006
Ad Manager [4]	$1,735	$3,007	$2,787	$3,122	$3,258	$2,372	$2,761	$19,042
Total	**$7,442**	**$12,898**	**$12,452**	**$15,605**	**$24,875**	**$27,773**	**$34,704**	**$135,748**
% Reduction from Lasinski Method = -79.6%								

Panel C Operating Profit & Share of Clicks

	Jul. - Dec. 2016	2017	2018	2019	2020	2021	2022	Total
App Promo [2]	$399	$692	$971	$2,183	$7,962	$12,186	$15,759	$40,152
AdMob [3]	$3,375	$5,851	$5,422	$6,074	$6,338	$4,616	$5,371	$37,047
Ad Manager [4]	$1,148	$1,989	$1,844	$2,065	$2,155	$1,569	$1,826	$12,596
Total	**$4,923**	**$8,532**	**$8,237**	**$10,322**	**$16,454**	**$18,371**	**$22,956**	**$89,795**
% Reduction from Lasinski Method = -86.5%								

Notes and Sources:

[1] Lasinski Report, Schedule 1.4.

[2] Exhibit 7A; Lasinski Report, Schedule 2.1. To calculate disgorgement of profit damages for App Promo under Mr. Lasinski's Scenario 2, the operating profits displayed in Exhibit 7A were multiplied by the Share of Revenue Attributable to Conversion Types Bid Against GA4F displayed in Schedule 2.1 of the Lasinski Report.

[3] Exhibit 7B; Exhibit 7D; Lasinski Report, Schedule 3.2. To calculate disgorgement of profit damages for AdMob under Mr. Lasinski's Scenario 2, the estimated damages under Scenario 1, shown in Exhibit 7D, were added to the remaining operating profits from Exhibit 7B multiplied by 50.42% (Apportionment for Diminished Ad Relevance with sWAA Off), as done in Schedule 3.2 of the Lasinski Report.

[4] Exhibit 7C; Exhibit 7D; Lasinski Report, Schedule 4.2. To calculate disgorgement of profit damages for Ad Manager under Mr. Lasinski's Scenario 2, the estimated damages under Scenario 1, shown in Exhibit 7D, were added to the remaining operating profits from Exhibit 7C multiplied by 50.42% (Apportionment for Diminished Ad Relevance with sWAA Off), as done in Schedule 4.2 of the Lasinski Report.

Exhibit 8
Summary of Adjustments to Mr. Lasinski's Disgorgement of Profit Damages

Scenario 1

($ Values in Millions)	App Promo	AdMob	Ad Manager	Total	% Reduction from Lasinski Method
Lasinski Method [1]	$332.0	$169.2	$57.5	**$558.8**	
Adjusting for sWAA Traffic (Using Share of Impressions) [2]	$225.3	$114.8	$39.0	**$379.2**	**-32.1%**
Adjusting for sWAA Traffic (Using Share of Clicks) [2]	$149.0	$76.0	$25.8	**$250.8**	**-55.1%**
Adjusting for Operating Costs [3]	$173.9	$77.0	$26.2	**$277.1**	**-50.4%**
Adjusting for Operating Costs & sWAA Traffic (Using Share of Impressions) [4]	$118.0	$52.2	$17.8	**$188.0**	**-66.4%**
Adjusting for Operating Costs & sWAA Traffic (Using Share of Clicks) [4]	$78.1	$34.5	$11.7	**$124.4**	**-77.7%**
Adjusting for Operating Costs & sWAA Traffic & iOS 14 (Using Share of Impressions) [5]	$60.7	$38.2	$13.0	**$111.9**	**-80.0%**
Adjusting for Operating Costs & sWAA Traffic & iOS 14 (Using Share of Clicks) [5]	$40.2	$25.3	$8.6	**$74.0**	**-86.8%**

Scenario 2

($ Values in Millions)	App Promo	AdMob	Ad Manager	Total	% Reduction from Lasinski Method
Lasinski Method [6]	$332.0	$248.0	$84.3	**$664.3**	
Adjusting for sWAA Traffic (Using Share of Impressions) [7]	$225.3	$168.3	$57.2	**$450.8**	**-32.1%**
Adjusting for sWAA Traffic (Using Share of Clicks) [7]	$149.0	$111.3	$37.8	**$298.2**	**-55.1%**
Adjusting for Operating Costs [3]	$173.9	$112.8	$38.3	**$325.1**	**-51.1%**
Adjusting for Operating Costs & sWAA Traffic (Using Share of Impressions) [8]	$118.0	$76.5	$26.0	**$220.6**	**-66.8%**
Adjusting for Operating Costs & sWAA Traffic (Using Share of Clicks) [8]	$78.1	$50.6	$17.2	**$145.9**	**-78.0%**
Adjusting for Operating Costs & sWAA Traffic & iOS 14 (Using Share of Impressions) [9]	$60.7	$56.0	$19.0	**$135.7**	**-79.6%**
Adjusting for Operating Costs & sWAA Traffic & iOS 14 (Using Share of Clicks) [9]	$40.2	$37.0	$12.6	**$89.8**	**-86.5%**

Sources:

[1] Lasinski Report, Schedule 1.3.
[2] Exhibit 4D.
[3] Exhibit 5D.
[4] Exhibit 6D.
[5] Exhibit 7D.
[6] Lasinski Report, Schedule 1.4.
[7] Exhibit 4E.
[8] Exhibit 6E.
[9] Exhibit 7E.